amateur radio

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

VOL. 46, No. 8 AUGUST 1978

CONTENTS

TECHNICAL

Afterthoughts 4
ATV Pictures from the Sky 42
Commercial Kinks 42
Delayed Braking Action for Rotators 27
Equipment Review: The Astro 200 Transceiver 16
Improving the Atlas 210X Transceiver 18
Modifying CB Transceivers to 10 Metres for $24 23
Novice Notes 35
Technical Correspondence 40
Video Gunnplexer System 28

GENERAL

Australian VHF, UHF, SHF Records 4
Cape York SSTV Dx-Pedition 34
Close Federal Look at CB 17
Midland Zone Convention 32
Programmes Specifically for Dxers and Keen SWLs 47
The "Solo" Voyage 6
VK/ZL/Oceania Dx Contest Rules — 1978 48

DEPARTMENTS

Amateur Satellites 51
Around the Trade 41
Awards Column 57
Contests 48
Divisional Notes 41
Hamads 57
IARU News 57
Intruder Watch 49
Ionospheric Predictions 47
LARA 41
Letters to the Editor 55
Magazine Index 57
QSP 3, 4, 12, 26, 47, 57
Repeaters 43
Silent Keys 58
VHF-UHF — an expanding world 50
WIANEWS 4
WICEN 49
20 Years Ago 43

ADVERTISERS' INDEX 58

COVER PHOTO

The yacht "Solo" in pack ice near the Balleny Islands. The radar scanner on the mizzen mast, and the long aerial joining the triatic stay to the mainmast can be seen.

See article The "Solo" Voyage on page 6.

Registered for posting as a Publication — Category "B".

HAM RADIO SUPPLIERS

323 ELIZABETH STREET, MELBOURNE, VIC., 3000

Phones: 67-7329, 67-4286

Our Disposals Store at 104 HIGHETT ST., RICHMOND (Phone 42-8136) is open Mondays to Fridays, 9.00 a.m. to 5.00 p.m., and on Saturdays to midday.

WALKIE TALKIE

SPECIFICATIONS:

TRANSMITTER — Frequency: in 27 MC citizen band, 27240. Final input power: 100 mW (max.). Communication Mod.: (AM) balanced mod. Oscillator: Crystal controlled. Antenna: Vertical type, telescopic antenna, 37" fully extended.
RECEIVER: Receiving System: Crystal controlled superheterodyne system. Sensitivity: S/N 10 dB or better at 10 uV 5 mW output. Selectivity: Thermistor: D-32S. Power Supply: 006p 9V. Dimensions: H — 17.6 cm, W — 6.5 cm, D — 4.4 cm. Weight: 500g.
PMG approved.

PRICE $58.90 PAIR
Postage $2.40

POWER-SWR METER

This is an in-line and SWR meter for ham radio and CB radio. This power meter indicates the output power of your transmitter and SWR meter reads the ratio of travelling power to your antenna and reflected back from antenna. Compact and inclined front design meet any radio operation desk.
SPECIFICATIONS — Range measured: Power meter 0-10, 100 watts, 2 ranges VSWR 1:1 — 1:3. Freq. response: 3-150 MHz. Impedance: 50 ohm. Dimensions: 70 x 98 x 100 mm. Weight: 900g.

PRICE $38.90
Postage $2.40

PL-259 Plug W/Reducer	**$1.50**
PL-259 Plug W/O Reducer	**$1.80 (Adaptors 65c)**
SO-239 Chassis Socket	**$1 50**
Right-Angle Joiner	**$2 75**
"T" Connection	**$3.50**
PL-259 to R C.A. Adaptor	**$2.75**
Coax Joiner, female to female, male to male	**$2.75**
BNC Plugs	**$1 95**
BNC Sockets	**$1 75**
Belling Lee Plugs	**75c**
Belling Lee Sockets	**50c**
Belling Lee Joiner	**85c**
100 Meters Roll Hook-Up Wire	**$4.50**

All above items plus postage

YAESU FRG-7

THE RADIO FOR WORLD-WIDE LISTENING AT ITS BEST — 0.5-29.9 MHz COVERAGE SYNTHESIZED COMMUNICATION RECEIVER

The model FRG-7 is a precision built high performance communication receiver designed to cover the band from 0.5-29.9 MHz. Its state of the art technology offers an unprecedented level of versatility. The Wad ey Loop System (drift cancellation circuit) coupled with a triple conversion super heterodyne system guarantees an extremely high sensitivity and excellent stability. It provides complete satisfaction to amateurs as well as BCLs with superb performance and many features such as RF attenuator, selectable tone, and automatic noise suppression circuit.

$348.00

BULK STORE DISPOSALS

AT 104 HIGHETT STREET
RICHMOND, 3121
Phone (03) 42-8136

100 FT. ROLL BELL WIRE — 16 Gauge
$3.00 per Roll

SINGLE CORE OUTSIDE SHIELDED CABLE 7/.0076, 100 yard rolls
$15.00 per Roll

OMRON RELAY MK 3 DC 35 volts, 3 amp rating, 3 pole changeover. To operate on 220 volts DC or 110 volts DC Series Resistor 6.83 watts
$5.00 each

NEW MAGNAVOX 53TS SPEAKERS
5" x 3" 8ohm, ideal for small extension speaker for communications equipment.
$1.95 each plus P&P

CRYSTALS FOR CITIZENS RADIO

Channel No.	Freq. MHz	Channel No.	Freq. MHz
1	27.015	11	27.135
2	27.025	12	27.155
3	27.035	13	27.165
4	27.055	14	27.175
5	27.065	15	27.185
6	27.085	16	27.195
7	27.095	17	27.205
8	27.105	18	27.225
9	27.115	19	27.880
10	27.125	20	27.240

$7.50 PAIR — Postage 25c

CRYSTALS MADE TO ORDER
$9.50 — Postage 25c

HANSEN SWR6

POWER METER & FIELD STRENGTH INDICATOR

Handy for checking transmitter operation. Uses bridge method for SWR measurements. Simple and accurate operation. CM method employed for RF power measurement.

PRICE $22.00
Postage $1.80

100 METRE ROLLS SPEAKER WIRE

$11.90 per roll — Post free

2 STN INTERCOM and battery 9V $12.90
3 STN INTERCOM and battery 9V $18.90 ea.
4 STN INTERCOM and battery 9V $26.90 ea.

Complete with 60 ft. wire, ideal for garage, baby room, etc. — **Postage $1.50**

ARLEC PLUG-PACK

PLUG-IN POWER SUPPLY

Plugs directly into 240 volt mains supply power sockets and provides 12 volt 1 amp smoothed DC for powering low voltage and battery operated equipment — Transceivers, cassette recorders, cartridge players, burglar alarms, electric models and toys, car radios, etc. 12 Volt 1 amp SEC approved, double insulated, overload protected.

PRICE $16.90 **Postage $1.80**

We also have a large range of **ELECTRONIC DISPOSALS EQUIPMENT,** including TRANSFORMERS, CABLE, TEST EQUIPMENT, TRANSMITTERS, METERS, etc.

You are invited to call in and inspect. **NO PARKING PROBLEMS A 104 HIGHETT STREET RICHMOND. Phone 42 8136.**

WE STOCK CB GEAR AS WELL AT VERY COMPETITIVE PRICES, INCLUDING ANTENNAS AND ACCESSORIES.

KEMTRONIC SSB1000

SSB/AM TRANSCEIVER
27 MHz CITIZENS RADIO SERVICE

The SSB 1000 embodies the latest in high frequency transceiver design techniques. It is designed to operate on either AM, USB or LSB. It is capable of transmitting and receiving on a total of 54 channels (18 AM, 18 USB, 18 LSB). The 18 channels are in accordance with the P&T. Dept conditions for operation of the Citizens Radio Service.

NETT PRICE $220.00
Registered Post — $4.00

TRADIPER MODEL TE-15

The Model TE-15 Transistorised Grid Dip Meter is a very accurate instrument operating from a 9 volt battery power supply. Six plug-in coils are supplied with each unit, covering the frequency range of 360 kHz to 240 MHz.
The Model TE-15 can be used for a number of useful purposes. With the most common use as a Grid Dip Meter, can also be employed as a relative field strength meter. It is ruggedly constructed and very light in weight. Because of transistorised circuit employed there is no need for an AC power supply as used in many other models. The Model TE-15 will certainly prove invaluable to radio amateurs.

PRICE $65.00
Postage $2.40

ARLEC PLUG-IN BATTERY CHARGER

Delivers 1 amp output at 12 volts. Designed to run continuously over long periods, will maintain a fully charged battery in peak condition or recharge flat battery. Double insulated for max. safety, electrically protected by fully automatic circuit breaker. No mains leads to get tangled, plugs directly into power socket. Comes with 3 metre battery leads fitted with clips. For use on 240V, 50 Hz supply.

PRICE $14.90
Postage $1.80

SPECIAL

9" x 6" SPEAKERS — brand new in cartons — 4 ohm impedance — ideal for car cassettes, radios, etc.

PRICE $4 00 EACH — Postage $1.00
10 FOR $3.00 — BULK BUY

MAIL ORDERS WELCOMED. Please allow pack and post on items listed on this page. If further information required send a stamped SAE for immediate reply from the above address. Larger items can be sent F.O.B. Due to circumstances beyond our control, prices quoted in this advertisement are subject to alteration without notice.

amateur radio

Published monthly as its official journal by the Wireless Institute of Australia, founded 1910.

AUGUST 1978
VOL. 48, No. 8

PRICE: 90 CENTS
(Sent free and post paid to all members)

Registered Office:
2/517 Toorak Road,
Toorak, Victoria, 3142.

EDITOR:
BRUCE BATHOLS* VK3UV

ASSISTANT EDITORS:
RON COOK* VK3AFW
GIL SONES* VK3AUI

TECHNICAL EDITORS:
BILL RICE* VK3ABP
KEN PALLISER VK3GJ

CONTRIBUTING EDITORS:
BOB ARNOLD VK3ZBB
BRIAN AUSTIN VK5CA
ROD CHAMPNESS VK3UG
SYD CLARK* VK3ASC
RON FISHER* VK3OM
DAVID HULL VK3ZDH
ERIC JAMIESON VK5LP
KEN JEWELL VK3AKK
PETER MILL VK3ZPP
KEVIN PHILLIPS VK3AUQ
LEN POYNTER* VK3ZGP

DRAFTING:
ALL DISTRICTS DRAUGHTING SERVICE
KEN GILLESPIE* VK3GK

PHOTOGRAPHER:
REG GOUDGE —

BUSINESS MANAGER:
PETER DODD VK3CIF

ADVERTISING:
PETER SIMMONS

***Member of Publications Committee**

Enquiries and material to:
The Editor,
PO Box 2611W, GPO Melb., 3001

Copy is required by the **first of each month.** Acknowledgement may not be made unless specially requested. All important items should be sent by certified mail. The editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

Advertising: Material should be sent direct to **P.O. Box 150, Toorak, Vic., 3142,** by the **25th of the second month preceding publication. Phone: (03) 24 8652.**—Hamads should be sent direct to **P.O. Box 150, Toorak, Vic., 3142,** by the **3rd of the month preceding publication.**

Trade Practices Act: It is impossible for us to ensure that advertisements submitted for publication comply with the Trade Practices Act 1974. Therefore advertisers and advertising agents will appreciate the absolute need for themselves to ensure that the provisions of the Act are complied with strictly. Readers are reminded that, when buying, obtaining or receiving goods from overseas including goods listed in advertisements by overseas organisations in this Journal, Customs import duties and Sales Tax may be levied on the goods at the time of importation. These amounts, if any, are payable by the purchaser unless the terms of sale state otherwise and the seller has made specific provision to this effect in his quotation to the buyer or unless other prior arrangements are in force between the buyer and the seller.

Printers: EQUITY PRESS PTY. LTD.
50-52 Islington Street, Collingwood, 3066
Tel.: 41-5054, 41-5055

QSP — NOVICE PRIVILEGES

During my recent visit to New Zealand discussion got around to the New Zealand novice class of licence. The comment was made to me that there had been remarkably few candidates presenting and that interest at this stage was at a remarkably low level. This surprised me because of the popularity of the novice class licence in Australia, however, further questioning elucidated the fact that the New Zealanders have quite restricted privileges, including a non-renewable tenure.

The Australian novice amateur certainly has many more privileges than his counterpart in many other countries, including the USA. As you know the Federal Council at this year's Federal Convention considered in depth many matters concerning novice licensing. Already since the introduction of the novice licence the WIA, with good reason, has obtained some extra privileges: the move to 28 MHz with a 500 kHz wide band and also permission to use VFOs. Currently the Institute is negotiating for the extension of the novice 80 metre segment. Nevertheless, the Federal Council was unanimous in agreeing that the novice grade licence should still be considered to be a stepping stone to the higher grades of licence.

They felt that as there are already quite liberal privileges for novices further extensions would tend to reduce the value of upgrading to an insignificant level. It was also felt that the examination standard is becoming more consistently at a level considered as suitable for novice entry into amateur ranks.

Those of us who in the past had no novice pathway into amateur ranks must now recognise the help that this grade has been in attracting recruits into the amateur service in the face of intense competition from many and varied types of recreational activity.

DAVID WARDLAW VK3ADW, Federal President. ■

WIRELESS INSTITUTE OF AUSTRALIA

Federal President: Dr. D. A. Wardlaw VK3ADW

Federal Council:
VK1 Brig. R. K. Roseblade VK1QJ
VK2 Mr. T. I. Mills VK2ZTM
VK3 Mr. J. Payne VK3AED
VK4 Mr. N. F. Wilson VK4NP
VK5 Mr. I. J. Hunt VK5QX
VK6 Mr. N. R. Penfold VK6NE
VK7 Mr. P. D. Frith VK7PF

Staff: Mr. P. B. Dodd VK3CIF, Secretary.
Part-time: Col. C. W. Perry, Mrs. J. M. Seddon and Mr. P. Simmons (AR advertising).

Executive Office: P.O. Box 150, Toorak, Vic., 3142. 2/517 Toorak Rd., Toorak, Ph. (03) 24 8652.

Divisional Information (all broadcasts are on Sundays unless otherwise stated):

ACT:
President — Mr. E. W. Howell VK1TH
Secretary — Mr. Ted Radclyffe VK1TR
Broadcasts— 3570 kHz & 146.5 MHz: 10.00Z.

NSW:
President — Mr. D. S. Thompson VK2BDT
Secretary — Mr. T. I. Mills VK2ZTM
Broadcasts— 1825, 3595, 7146 kHz, 28.47, 52.1, 52.525, 144.1, Ch. 8 and other relay stations: 01.00Z. (Also Sunday evenings 09.30Z and Hunter Branch, Mondays 09.30Z on 3570 kHz and ch. 3 and 6).

VIC.:
President — Mr. E. J. Buggee VK3ZZN
Secretary — Mr. J. A. Adcock VK3ACA
Broadcasts— 1825, 3600, 7135 kHz — also on 6m, 2m SSB and 2m Ch. 2 repeater: 00.30Z.

QLD.:
President — Mr. A. J. Aarse VK4QA
Secretary — Mr. W. L. Gielis VK4ABG
Broadcasts— 1825, 3580, 7146, 14342, 21175, 28400, kHz; 2m (Ch. 42, 48): 09.00 EST.

SA:
President — Mr. C. J. Hurst VK5HI
Secretary — Mr. C. M. Pearson VK5PE
Broadcasts— 1820, 3550, 7095, 14175 kHz; 28.5 and 53.1 MHz, 2m (Ch. 8): 09.00 S.A.T.

WA:
President — Mr. L. A. Ball VK6AN
Secretary — Mr. P. Savage VK6NCP
Broadcasts— 3600, 7080, 14100, 14175 kHz, 52.656 and 2m (Ch. 2): 01.30Z.

TAS.:
President — Mr. I. Nicholls VK7ZZ
Secretary — Mr. M. Hennessy VK7MC
Broadcasts— 3570, 7130 kHz: 09.30 EST.

NT:
Secretary — Mr. Henry Andersson VK8HA
Broadcasts— Relay of VK5WI on 3.55 MHz and on 146.5 MHz at 2330Z. Slow morse transmission by VK8HA on 3.555 MHz at 1000Z almost every day.

Postal Information:
VK1 — P.O. Box 46, Canberra, 2600.
VK2 — 14 Atchison St., Crows Nest, 2065 (Ph. (02) 43 5795 Tues & Thurs (10.00-14.00h).
VK3 — 412 Brunswick St., Fitzroy, 3065 (Ph. (03) 41 3535 Sat 10.00-12.00h).
VK4 — G.P.O. Box 638, Brisbane, 4001.
VK5 — G.P.O. Box 1234, Adelaide, 5001 — HQ at West Thebarton Rd., Thebarton (Ph. (08) 254 7442).
VK6 — G.P.O. Box N1002, Perth, 6001.
VK7 — P.O. Box 1010, Launceston, 7250.
VK8 — (incl. with VK5), Darwin AR Club, P.O. Box 37317, Winnellie, N.T., 5789.

Slow morse transmissions — most week-day evenings about 09.30Z onwards around 3550 kHz.

VK QSL BUREAUX
The following is the official list of VK QSL Bureaux, all are inwards and outwards unless otherwise stated.

VK1 — QSL Officer, G.P.O. Box 1173, Canberra, A.C.T. 2601.

VK2 — QSL Bureau, C/- Hunter Branch, P.O. Teralba, N.S.W. 2284.

VK3 — Inwards QSL Bureau, Mr. E. Trebilcock, 340 Gillies Street, Thornbury, Vic. 3071.

VK3 — Outwards QSL Bureau, Mr. R. R. Prowse, 83 Brewer Road, Bentleigh, Vic. 3204.

VK4 — QSL Officer, G.P.O. Box 638, Brisbane, Qld., 4001.

VK5 — QSL Bureau, Mr. Geo. Luxon VK5RX, 27 Belair Road, Torrens Park, S.A. 5062.

VK6 — QSL Bureau, Mr. J. Rumble VK6RU, G.P.O. Box F319, Perth, W.A. 6001.

VK7 — QSL Bureau, G.P.O. Box 371D, Hobart, Tas. 7001.

VK8 — QSL Bureau, C/- VK8HA, P.O. Box 37317, Winnellie, N.T., 5789.

VK9, 0 — Federal QSL Bureau, 23 Landale Street, Box Hill, Vic. 3128.

WIANEWS

NOVICE EXAMINATION

The Federal Education Co-ordinator, Graeme Scott, VK3ZR, arranged a special meeting early in June of educational experts, mainly from Victoria and New South Wales. A bank of nearly 500 Novice examination questions and answers was prepared, the bulk of which were transcribed on to systems cards for ultimate presentation to the Department. In addition arrangements were set in hand relating to typical question papers for Trial Novice exams and similar purposes.

TV CHANNEL 5A

As already reported, the Executive was heavily engaged with the problems of TV Channel 5A. The use of this channel, unique to Australia and adjacent to the 2m band, continues to be opposed.

EXECUTIVE MEMBERS

The departure overseas of Keith Roget, now VR4AV as well as VK3YQ, results in a vacancy for Honorary Treasurer. Certain office re-organisation appeared necessary to relieve the future Treasurer of much of the routine work so well carried out in the past by Keith for whom a most grateful vote of thanks was recorded. Any qualified volunteers to help out in this field would be greatly welcomed. ■

AFTERTHOUGHTS

AN ULTRA LOW-NOISE FET VIDICON AMPLIFIER

(June, 1978)

The following information was omitted from Figure 1:

1. The bypass capacitor at the target bias input should be 100 nF, 100 VW.
2. The collector of Q6 should be marked point "A".
3. The direction of clockwise rotation of potentiometers are as follows: AMP BIAS: right, LF COMP: up, SET UP: down, SYNC LEVEL: up. ■

QSP

GIPPSLAND GATE RADIO CLUB
Oakwood Park Scout Hall, Heyington Crescent, Noble Park (opposite Titcher Road).

Postal: P.O. Box 98, Dandenong 3175.

Meetings: Second and fourth Friday of each month at 8.45 p.m.

President: John Watkins VK3EW.

Phone: 792 2422.

Club Callsign: VK3BJA.

Educational Classes for NAOCP: conducted Monday nights at above address. For details contact Lionel Curling VK3NM. Phone 88 3710.

CLUB NETS
Sundays: 10 metre net 28.4 MHz, 12 noon EST. 2 metre net ch. 50 (146.5) 7.30 p.m. EST.
Thursdays: 80 metre net, 3.560 MHz, 8 p.m. EST.

USA — BAN ON CERTAIN LINEARS

The FCC has, in Dockets 21116-7, voted to prohibit the manufacture, import or marketing of external RF power amplifiers capable of operation on any frequency from 24 to 35 MHz. It also voted to require, for three years, type acceptance of all RF amplifiers capable of operation below 144 MHz manufactured, marketed or imported for use in the Amateur Radio Service.—Worldradio May 1978.

The FCC comment was that half of all complaints of CB-related interference resulted from the illegal use of external amplifiers and that many CBers complained they were themselves blocked by others using such amplifiers.

NOVICE SYLLABUS

Copies of the recent P. and T. approved Novice syllabus and study guide are available free to class leaders and instructors.

Please forward details of your involvement to the WIA Federal Office, P.O. Box 150, Toorak, Vic. 3142.

JOTA 1978

Have you made arrangements to help out for the 21st JOTA beginning about 00.01h local time on 21-10-1978 and ending 48 hours later? The official World Scout frequencies are 3740, 7090, 14290, 21360, 28990 kHz phone and 3590, 7030, 14070, 21140 and 28190 kHz CW. Listen before calling "CQ Jamboree". ■

AUSTRALIAN VHF, UHF, SHF RECORDS

AS AT 1 JUNE 1978

			km	miles
NEW SOUTH WALES				
50/52 MHz	VK2ADE to VE7AQQ	8/4/59	11,778	7,320
144 MHz	VK2ATO/2 to ZL2HP	2/1/66	2,344	1,457
432 MHz	VK4ZT/2 to VK4KE/4	12/7/69	352	219
576 MHz	VK2HO to VK2ZAH/2	12/3/61	107	66
1,296 MHz	AX4ZT/2 to AX4NO/4	12/4/70	402	250
2,300 MHz	VK2ZAC/2 to VK2BND/2	19/5/73	159.9	99.4
3,300 MHz	**VK2AHC/2 to VK2SB/2**	**16/1/77**	**114.1**	**70.9**
5,650 MHz	**VK2AHC/2 to VK2SB/2ZND/2**	**12/4/75**	**114.1**	**70.9**
10,000 MHz	**VK2AHC/2 to VK2SB/2ZND/2**	**12/4/75**	**114.1**	**70.9**
VICTORIA				
50/52 MHz	**VK3ALZ to XE1FU**	**1/5/59**	**13,545**	**8,418**
144 MHz	VK3ZNC to ZL2HP	13/12/65	2,692	1,673
432 MHz	**◈ VK3ZQV to VK6XY**	**22/2/78**	**2,593**	**1,612**
576 MHz	VK3AOT/3 to VK3ZKB/3	11/4/71	237	147.5
1,296 MHz	VK3AKC to VK7ZAH	17/2/71	439	273
2,300 MHz	**VK3ATY/3 to VK3ZHU/3**	**6/12/74**	**210.5**	**130.8**
3,300 MHz	VK3ZGT/3ZGK/3 to VK3ZDQ/3	14/12/63	101.4	63.0
5,650 MHz and above	No claims			
QUEENSLAND				
50/52 MHz	VK4ZAZ to K6ERG	16/3/58	8,536	5,305
144 MHz	VK4RO to VK3AMK	21/12/74	2,079	1,292
432 MHz	VK4KE/4 to VK4ZT/2	12/7/69	352	219
576 MHz	No claim			
1,296 MHz	AX4NO/4 to AX4ZT/2	12/4/70	402	250
2,300 MHz and above	No claims			
SOUTH AUSTRALIA				
50/52 MHz	VK5KL to W7ACS/KH6	26/8/47	8,626	5,361
144 MHz	**VK5BC to ZL2HP**	**23/12/65**	**3,149**	**1,957**
432 MHz	**AX5ZKR to AX7ZRO/7**	**15/3/70**	**776**	**482**
576 MHz	**VK5ZJL/5 to VK5QZ/5**	**28/12/69**	**314**	**195**
1,296 MHz	**◈ VK5QR to VK6WG**	**25/1/77**	**1,885**	**1,171**
2,300 MHz	**◈ VK5QR to VK6WG**	**17/2/78**	**1,885**	**1,171**
3,300 MHz	No claim			
5,650 MHz	No claim			
10,000 MHz	VK5CU/5 to VH5ZMW/5	30/12/71	95.7	59.5
WESTERN AUSTRALIA				
50/52 MHz	VK6BE to JA8BP	30/10/58	8,833	5,490
144 MHz	VK6KJ to VK3AOT	1/2/70	2,441	1,517
432 MHz	**◈ VK6XY to VK3ZQV**	**22/2/78**	**2,593**	**1,612**
576 MHz	VK6ZDS to VK6LK/6	15/12/63	163	101
1,296 MHz	**◈ VK6WG to VK5QR**	**25/1/77**	**1,885**	**1,171**
2,300 MHz	**◈ VK6WG to VK5QR**	**17/2/78**	**1,885**	**1,171**
3,300 MHz and above	No claims			
TASMANIA				
50/52 MHz	VK7LZ to JA9IL	3/12/59	8,788	5,462
144 MHz	VK7ZAH to VK4ZAZ	1/1/67	1,910	1,187
432 MHz	AX7ZRO/7 to AX5ZKR	15/3/70	776	482
576 MHz	No claims			
1,296 MHz	VK7ZAH to VK3AKC	17/2/71	439	273
2,300 MHz and above	No claims			
	Australian records are in bold type.			
AUSTRALIAN EME RECORDS				
144 MHz	VK3ATN to K2MWA/2	28/11/66	16,761	10,417
432 MHz	**◈ VK2AMW to G3LTF**	30/3/74	16,955	10,536
1,296 MHz	VK3AKC to W2NFA	6/10/73	16,713	10,385
AUSTRALIAN ATV RECORDS				
432 MHz	VK7EM/T to VK3ZPA/T	13/12/72	413	256.6
	◈ Also world record.			

Before a contact can be listed as an Australian (or world) record, a claim must be made in writing to the Federal Office of the WIA. All claims are processed by the VHF Advisory Committee in conjunction with an Independent invigilation. ■

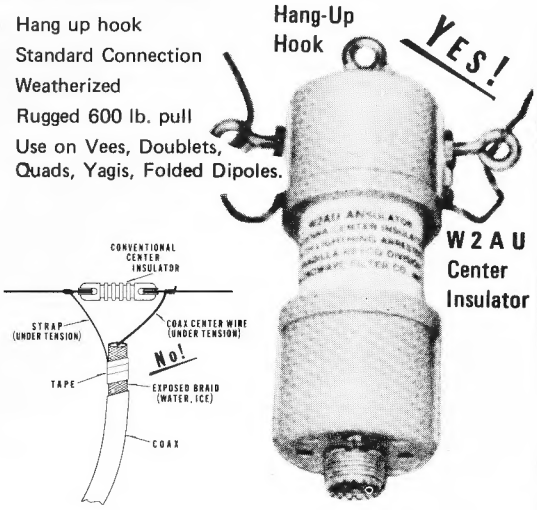
RADIO AMATEUR BAND ANTENNA PRODUCTS

SCALAR

W2AU "ANSULATOR"

Antenna Centre Insulator by Unadilla/Reyco with built-in lightning arrestor.

- Hang up hook
- Standard Connection
- Weatherized
- Rugged 600 lb. pull
- Use on Vees, Doublets, Quads, Yagis, Folded Dipoles.

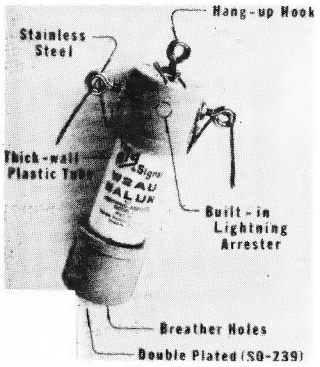


THE BIG SIGNAL W2AU BALUN

2 Models

W2AU (1:1) matches 50-75 ohms coax. to 50-75 ohm bal.

W2AU (4:1) matches 50-75 ohms coax. to 200-300 ohms balanced.



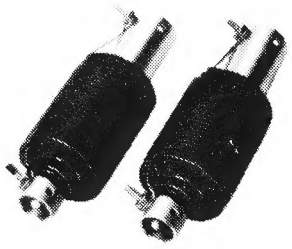
- Broadband 3-40 MHz
- 1 KW plus
- Weatherproof
- Lightning arrestor
- Prevents coax radiation and interference
- Balances your antenna current and restores full gain
- Use on inverted Vees, doublets, quads, Yagis.

"the old™ reliable" REYCO

Multiband Antenna Coils

Model			
	KW-40	40m	(7 MHz)
	KW-20	20m	(14 MHz)
	KW-15	15m	(21 MHz)
	KW-10	10m	(28 MHz)

KW 40 These coils are the standard five band coils to provide operation on 10-15-20-40- and 80 with an approximate length of 108 feet.

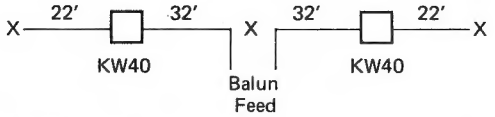


KW 10 KW 15 KW 20
Coils resonant in designated bands to provide perfect dipoles in each band. Using these coils together with a pair of KW-40 coils five band operation can be obtained with a total length between 85 and 95 feet.

SPECIFICATIONS

POWER	2KW PEP (minimum)
WEIGHT	6 ounces (max) PER COIL
SIZE	1.8" dia (max) x 5.5" long (max)
ABSORPTION	WATERPROOF COATING
STRENGTH	300# (min) TENSILE STRENGTH
CORROSION	ALL metals aluminium, including screws, nuts, washers, to resist interface corrosion
HI-Q	OPTIMUM FORM FACTOR ON POLY

USING THE KW-40 COIL AS A FIVE BAND ANTENNA



SCALAR INDUSTRIES PTY LTD

VIC. 20 Shelley Avenue, Kilsyth, 3137. Tel: 725-9677. Cables: WELKIN. Telex: AA34341
N.S.W. 20 The Strand, Penshurst, 2222. Telephone: 570-1392. Telex: AA27067
QLD. Scalar (Qld.) P/L., 969 Ann St., Fortitude Valley, 4006. Tel: 52-2594. Telex: AA43007
W.A. Everett International
17 Northwood St., West Leederville, 6007. Tel: 381-5500. Telex: AA92811

THE "SOLO" VOYAGE

Pieter Arriens VK1PA
22 Eucumbene Drive, Duffy, ACT

"Solo", a 57 foot steel yawl, recently completed a round trip from Sydney to Cape Adare (lat. 71°30'S, long. 170°24'E) on the Antarctic mainland. She called at the very rarely visited Balleny Islands on the way south, and at Macquarie Island on the return journey. In addition to amateur radio, "Solo" carried small ship voluntarily fitted marine HF radio, four "walkie-talkies", a communications receiver and a satellite buoy.

All of this equipment (and a radar set) was thoroughly tested by a cold, wet and salty environment on a 79 day voyage through rough seas to the zone of pack ice which surrounds the Antarctic continent. Portable equipment taken ashore for ship-to-shore communication had to suffer the further indignity of transport on inflatable dinghies through surf.

Some useful lessons were learned, and to put this in context I should perhaps first explain how I came to be involved with radio operations on board "Solo" and in particular with amateur radio. Three summer field seasons with the ANARE (Australian National Antarctic Research Expeditions) had already given useful experience with the operation of field radios in Antarctica, when in 1976 I returned for a year south as Officer-in-Charge of Davis Station. Radio communication was a very important part of station operations, not only with regard to radio telephone, teletype and facsimile services within Antarctica and to Australia, but also for maintaining contact with field parties (and the related question of search-and-rescue procedures). One of the fourteen men at Davis moreover was an amateur operator (David Barrett VK0ZI). The excellent quality of his radiotelephony contacts with amateurs in Australia and elsewhere was a revelation, and planted the seeds of my own future involvement with amateur radio.

In January 1977, the relief ship arrived and the new party changed over with the old. Among those to arrive in the new party was the 1977 radio operator for VLZ Davis, Col Christiansen, who was also an active amateur operator there under the call sign VK0CC. As incoming postmaster, Col brought the first mail the old party had received since the last relief ship called 11 months previously.

One of my letters was from David Lewis, whom I knew in Canberra and from ski-touring in the Snowy Mountains, before he embarked in 1972 on his single-handed voyage to Antarctica on "Icebird". David asked if I was still interested in his plans for an independent expedition to Antarctica in a sailing vessel, for this was something we had discussed in Canberra in 1975 before I left for the year south at Davis.

Adelie and Chinstrap Penguins on Sabrina Island.

Col, too, had met David and was also interested in these plans. A year later, towards the end of his year at Davis, Col was to give great assistance to the "Solo" expedition by splendid radio relay work, both on the amateur bands and as the operator of radio VLZ Davis. But that is to anticipate.

After my return to Australia early in 1977, I became committed to the expedition, and my responsibilities included drafting a scientific program, and making preparations for radio communication. The expedition was beyond David Lewis' personal financial resources, and there were many vicissitudes before an effective organisation was put together to manage the project. It was not until a mere five weeks before departure, that "Solo" was purchased, and at that stage the expedition was critically short of funds and time.

PREPARATIONS FOR RADIO COMMUNICATION

The need for Amateur Radio

It seemed to me, among other things, that amateur radio, especially in the 20 metre band, was an essential thing to have on board a yacht in remote areas of the Southern Ocean. As no other potential crew member was qualified, this gave me an uncomfortable short time before sitting the three AOCP examinations. During this time, the friendly help of many radio amateurs, the clear and concise advice from the District Radio Officer (John Gore) on the requirements for the AOCP examinations, and the regular WIA morse code broadcasts were all of the utmost help. The call sign VK1PA was obtained in November, which gave just five weeks to purchase amateur radio equipment, mostly secondhand, for use on the expedition.

Equipping the Amateur Station

If "small is beautiful" when it comes to housing radio gear, the Atlas 210X was a likely choice, and it happened that a rig was for sale secondhand through "Amateur Radio Ham-Ads". That settled, the next things required were an aerial tuning unit (Tokyo Hy-Power HC500), SWR meter, CW key, assorted cable and connectors, coax switches, a set of whips for emergency use (Asahi, for 80, 40, 20, 15 and 10 metre bands), and three microphones. The Atlas was thoroughly checked by Ed Penekis (VK1VP) with elaborate test equipment, and apart from requiring some adjustment for carrier suppression, was found to be working entirely within specifications.

A strong metal cupboard measuring 390 x 390 x 300 mm was made from 14 gauge zincanneal and heavy plywood, to house the Atlas, ATU, SWR meter, CW key and microphone. If required the entire rig in its cupboard could have been quickly removed from the cabin for portable use outside, and for this purpose an insulated

base was bolted to the cupboard to provide a mounting base for the Asahi whips. For extra back-up, an early model Yaesu FT101 transceiver, which had seen service on board the "La Balsa" raft, was borrowed for the expedition and kept stowed away in reserve.

Marine Radio
Two 100W Stingray SSB marine radios, fitted with channels for small ships' frequencies up to 6 MHz, and a dual frequency 13 MHz radfone channel, were generously loaned by Findlay Electronics Pty. Ltd. (M. Findlay VK2PW). For reasons which need not be discussed, this equipment was installed at extremely short notice, and crystals for some of the frequencies appropriate for use in contacting Antarctic stations had to be rushed from Singapore.

Three of the crew were examined the day before departure — Lars Larsen and myself for Restricted Certificates in radiotelephony/radio telegraphy, and Jack Pittar in radio telephony. The equipment itself was inspected on the morning of departure, when the radio licence and call sign VJ6764 were issued. The splendid co-operation of the Postal and Telegraph Department, and Mr. Findlay's strenuous work with Jack's assistance in having the Stingray radios installed before the date of departure, are gratefully acknowledged, and resolved what otherwise would have been a difficult situation.

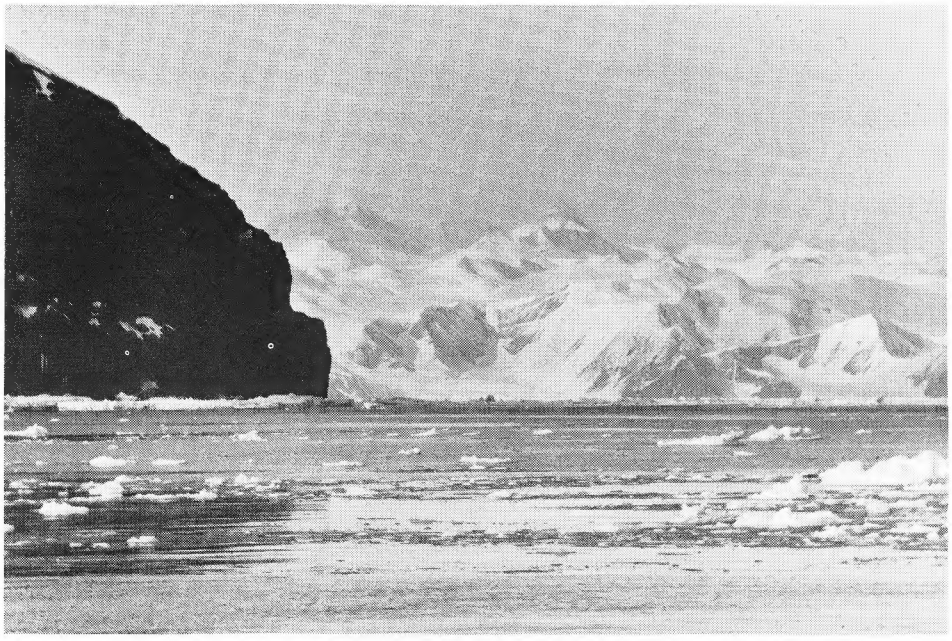
Aerials
"Solo" when purchased had a long wire aerial which ran from the top of the mainmast to the top of the mizzen (triatic stay) and then almost vertically down to the cabin, giving an outside length of about 21 metres. This aerial was used mainly by the Atlas and for general shortwave broadcast reception. A second wire aerial about 5 metres long was installed mainly for use by the Stingray radios. It ran up from the cabin towards the radar scanner which is halfway up the mizzen mast.

Provision had to be made for the contingency that either or both of the masts might be lost if "Solo" were rolled or severely knocked down by a huge breaking sea. Although such an event is unlikely in a yacht of the size of "'Solo", the loss of the mizzen mast by itself would have carried away both aerials, and the longer of the two aerials would have gone with dismasting of the main mast. Accordingly, an insulated base which normally served as the feed point for the shorter aerial, was fixed to the cabin roof. A 4 metre whip was carried, and could have been mounted on this insulated base. The screw thread for the Asahi whips was smaller, but an adaptor was turned so that if required the Asahi loaded whips could have been mounted for emergency amateur use.

Power Supplies
"Solo" had two battery systems when purchased. The main batteries were two very large lead-acid accumulators of about 180 ampere hours capacity, which gave a positive earth 24V system for the ship's electrical equipment which included an autopilot, radar, echosounders, sheet winches, lighting, and a bilge water level warning light. Two heavy duty truck batteries, in an entirely separate 24V system, served solely for starting the diesel engine.

When the 100 h.p. Perkins diesel engine ran, two generators, each with its own regulator, separately charged these two battery systems. The main batteries could also be charged by an ancillary petrol-powered generator. This was hardly ever used, because there was another generator which was driven by the free wheeling rotation of the propellor when "Solo" was under sail. This generator was brought into use by releasing a clutch, which decoupled the propellor shaft from the engine. When "Solo" was doing over 5 knots under sail (which she did in almost any wind except when hove to), the propellor generator could deliver up to 8 amps of power to the main 24V system. This was an extremely valuable source of power, which made no noise or exhaust fumes. A portable 150W Honda generator, capable of charging 12V batteries, was also taken on the voyage, but was not used.

An additional pair of heavy duty truck batteries was installed specifically for the radios, among other reasons because the Atlas required a 12V *negative* earth supply. Apart from this reason, it was desirable to isolate the radio batteries from voltage transients such as would have been introduced by the operation of the heavy electric sheet winches. Separate radio batteries moreover would have allowed one or both of the radio batteries to be removed without disabling any of the ship's electrical system, if it were wished to operate the amateur rig in a portable mode outside.



Telephoto shot of Cape Adare, with the Admiralty Range rising to nearly 4000 metres in the background.

Walkie Talkies
Four hand-held 5W Midland AM transceivers were donated by Dick Smith Electronics, for short haul ship-to-shore communication. These were powered either by re-chargeable Ni-cads or by dry cells, and operated on a frequency of 27.88 MHz.

Satellite Buoy
The CSIRO Division of Oceanography and Fisheries at Cronullla, NSW, loaned a satellite buoy of the sort used for oceanographic research on seawater temperatures and currents. These buoys are designed to drift behind a sea anchor, and have a panel of solar cells to provide power for the transmitter. Unlike earlier battery-powered designs which incorporated a receiver and transponded when interrogated by the satellite, this design of buoy simply transmitted to a NASA satellite. The transmitter circuitry was entirely enclosed within the sealed 1½ metre long fibreglass buoy, which had an antenna "tail" about ½ metre high also enclosed in fibreglass.

The main purpose of carrying the buoy on board "Solo" was to give at least one satellite position fix daily, accurate to within a kilometre. These positions would be available later (but not in real time for navigation) to make adjustments to interpolated dead reckoning positions on days when cloud or fog prevented taking position in the traditional way by measuring the sun's altitude with a sextant. The satellite buoy was mounted on a steel framework welded to the deck beside the cockpit, and in a very elegant way would have provided means of surveillance of "Solo's" position if all the other radio gear had ceased to work.

Memorandum on Communications

A document giving precise details of all radio equipment on board "Solo" was circulated to various organisations and persons, including the Marine Operations Centre in Canberra, the Antarctic Division in Melbourne, and amateur radio operators.

GENERAL NARRATIVE ON VOYAGE

"Solo" sailed from Sydney Harbour at midday on 15 December, 1977. On board were:—

Dr. David Lewis — Skipper, navigator, medical officer, leader of expedition.

Lars Larsen — First mate, diesel mechanic, radio operator, second-in-charge.

Dr. Pieter Arriens — Responsible for meteorology, geology, and bottom sampling program. Amateur operator and main operator of marine radio.

Dr. Peter Donaldson — Responsible for biological studies, seawater temperature and salinity measurements, film sound recorder and assistant cameraman.

Jack Pittar — Electronics technician, maintained all electric and electronic systems on board. Radio operator.

Ted Rayment — ABC cameraman/film producer.

Fritz Schaumberg — Mountaineer, skier and scuba diver.

Mrs. Dorothy Smith — Mountaineer, major role in galley.

Soon after clearing Sydney Harbour Heads, stormy weather set in, and a very tired crew (after all the intense work before leaving) was at once put to the task of making frequent sail changes. Everyone was short of sleep, and the four hours on, four hours off watch system, although necesary, did not help towards becoming adjusted to shipboard life. In addition to normal deck duties, I had to take weather observations every six hours, and transmit the coded data through OTC coastal stations to the Bureau of Meteorology in Melbourne. The Stingray equipment worked well, and apart from bringing marine weather forecasts, which were useful until "Solo" was out of coastal waters, there were also messages about several small craft which were in difficulties.

No amateur radio transmissions were made during the first six days, owing to problems with charging the radio batteries. On 21 December the log book for the new call sign opened its account with contacts to New Zealand (ZL1CU) and Antarctica (Col VK0CC, at Davis). Daily amateur radio skeds to Australia and Antarctica progressively improved, although as will be detailed in the technical narrative, another three weeks were to pass before problems with charging the radio batteries were finally resolved.

Meanwhile, "Solo" once clear of Tasmania, was favoured by good sailing winds and in one 24 hour period, while passing well to the west of Macquarie Island, she logged 184 nautical miles, and this while still very heavily laden with stores and emergency fuel. Marine radio telephone contact with the coastal stations became harder as the distance from Australia increased, for the highest small ship frequencies available were in the 6 MHz range. Once past Macquarie Island nearly all the official telegraphic messages from "Solo" (including the four ship's wireless weather reports a day) were passed through VLZ Davis or VJM Macquarie Island, and the OTC coastal stations likewise relayed telegrams for "Solo" through those stations.

Air and seawater temperatures fell as "Solo" moved to higher latitudes, and more and more time was required to change in and out of bulky, warm clothing. On 2 January, 1978, as anticipated when seawater temperatures fell below 1°C, the first icebergs were sighted, and a day later pack ice was met at about latitude 63°S. This was less than three weeks since leaving Sydney, and "Solo", twice a winner of the Sydney-Hobart yacht race, had given a good account of herself.

Further progress south was obstructed for a while by a mass of pack ice congested around the Balleny Islands. There were long fingers of pack ice with deep embayments of open water (on a scale of tens of miles) which made for confusing navigation, especially as the radar set was not working then. Visibility was often poor, and the magnetic compass was wildly unreliable in a steel boat close to the south magnetic pole.

It was soon after meeting the pack ice, when "Solo" was being sailed too fast in fog, that she hit an ice floe. A pea-sized hole was opened under water in one of the plates on the starboard side, about four metres from the bow. The damage was repaired with a patch of neoprene rubber wedged in position — and the whole area

Author Pieter Arriens VK1PA with the yacht's Amateur Radio installation.

was stabilised with a patch of cement. At no stage was there the slightest difficulty in keeping the bilges pumped dry. Every five minutes or so the bilge water level warning light would come on, and ten to fifteen strokes of one of the hand-pumps would clear the water. The incident, however, gave fair warning that greater care would be needed in negotiating areas of pack ice.

Prior arrangements had been made with the Commander of the US Fleet weather facility, and at our request ice forecasts from the US were sent to McMurdo Station in Antarctica, and relayed by Col Christiansen through VLZ Davis. The ice reports were based on satellite microwave imagery which is capable of delineating the boundary of pack ice, even through totally cloudy skies, and our experience every time was to confirm the extraordinary precision of the US ice forecasts. This knowledge made it possible to detour around the pack ice and approach the Balleny Islands through open water from the east. About five days later, Buckle Island was sighted about 8 miles distant across a belt of pack ice, but a strong easterly wind sprang up, and "Solo" was taken away from the island. The wind later veered through the south-east, south-west and finally to the north-west, rising to force 11 on the Beaufort Scale (*mean* wind speed of 60 knots), when the barometer began to rise from a minimum of 950.9 mb. "Solo" was in open water during the storm, which pushed the margin of the pack ice to the west and south, beyond the Balleney Islands.

When the storm abated and visibility improved on 13 January, Sturge Island, the largest and southernmost in the Balleny group, was sighted downwind. "Solo" was taken close to shore along the east coast to the south-east end of the island, where an excellent anchorage was discovered in less than 10 fathoms of water, at lat. 67° 35'S, long. 64° 50'E. Landings were made on a gravel isthmus which tied a small snow shrouded hill to Sturge Island proper. Many Weddell seals were hauled out on the snow, but no penguins were seen ashore. Ship-to-shore contact was made with the Midland transceivers, one of which was put out of action by immersion in salt water.

Next morning, pack ice was observed moving in from the south, and "Solo" was therefore taken away from the anchorage and back the 20 miles along the east coast. The rest of the coast was hostile, with the ocean swell braking on rocky shores, and steep slopes rose 500 metres to the corniced edge of an ice cap which covered the top of the island. Several glaciers came down to sea level from the ice cap.

There was open water and good visibility overnight on the way to Buckle Island which was reached next morning. At the south end of Buckle Island, "Solo" was taken to a small island, Sabrina Island, which is tied by a gravel spit to a spectacular 100 metre high spire of volcanic rock named "the Monolith". Hundreds of Adelie penguins and a few chinstrap penguins occupied a rookery about 50 metres above sea level, and the adults were commuting up and down a steep snow slope to the sea, to gather food for feeding their chicks.

The surf landings to get ashore on the boulder beach had been quite violent, and after a few hours the swell rose further, so it was prudent for those still ashore to return to the ship. The Beaufort inflatable rubber dinghy and 25 h.p. Evinrude outboard motor performed splendidly. Overnight, but still with adequate daylight, "Solo" probed along the east coast of Buckle Island, which was even more forbidding than the coast of Sturge Island. Hanging glaciers came down from the ice cap, and a heavy swell surged along the rocky coast. It was our good fortune on "Solo" to have had good if overcast weather near the island, and the rugged scenery seen in the dim light of the early morning hours left a lasting impression.

Louis Bernacchi, an Australian on Borchgrevink's expedition of 1875-1900, aptly wrote of Buckle Island that "One sight in bad weather of that sinister coast is enough to make a landsman dream for weeks of shipwrecks, perils and death".

One rookery of Adelie penguins was perched high up on a ridge, perhaps the only site where a rookery would not be swept away by avalanches breaking from the edge of the ice cap. A predatory Leopard seal was waiting in the water, doubtless succeeding to extract a toll on the traffic of penguins driven to the water to fetch food for their chicks.

Further progress was made for some hours towards Borradaile Island and Young Island, which were visble in the distance north of Buckle Island, but the pack ice was already streaming back eastwards through the gaps between the islands, so a course was set east for the open water which had been our entry to the Balleny Islands. Once back in the open water of the Northern Ross Sea, it was decided on 18 January to turn south for the historic site of Cape Adare on the Antarctic mainland.

It was here Sir James Clark Ross first sighted this part of the Antarctic mainland and named the cape. Over 50 years later the first ever landing on the Antarctic mainland proper was made at Cape Adare, and a few years later, in 1899, the first wintering party to stay ashore in Antarctica built their two huts, and took their provisions ashore. Without radio or any other contact, they watched their relief ship depart for Australia, not to return until the following summer. Twelve years later, the northern part of Scott's ill-fated last expedition built a third hut and spent one winter there.

With great anticipation, therefore to nearly all aboard "Solo" saw the splendid sight of the Admiralty Range with peaks rising over 4000 metres, on the horizon from at least 70 miles offshore. On 23 January, "Solo" was taken through about half a mile of pack ice to a pool of open water near the Cape, from where landings were made to reach the huts, in two successive sorties with half of the party at a time. Each group had a bare threequarters of an hour ashore. After this briefest of stays, and with the glorious backdrop of the Admiralty Range still visible for hours, "Solo" was turned north away from Antarctica.

After two weeks of storms and contrary winds, "Solo" arrived in the vicinity of Macquarie Island, which lay shrouded in fog. Celestial navigation was hindered by fog which concealed the horizon, and cloud which hid the sun. For three days, the exact whereabouts of the island remained a mystery, but much kelp and many penguins in the water, and cormorants flying past the boat, confirmed the close proximity of the island. Perhaps the Macquarie Islanders even began to doubt whether "Solo" would ever make landfall, but then Jack repaired the radar set. The rest was ridiculously easy. We motored in overnight and anchored before dawn on 11 February.

We were given a very warm welcome at Macquarie Island, and the imbounded hospitality of the islanders was sustained until we left. Simple things like a hot shower or a bunk which stayed still were almost inconceivable luxuries after two months at sea. Members of the crew took turns to keep watch on board, and for two days as a precautionary measure, "Solo" had to be taken out to sea when the wind shifted.

Those ashore could do what they wished, and all found the astonishing range and abundance of wildlife to be a constant delight. I went for a walk, spending two nights away in field huts, and enjoyed fine opportunities for photography. The splendour of hundreds of King penguins (with bright orange markings) parading on vividly green grass must rank as one of nature's wonders. Meanwhile, "Solo" was used as a ferry to carry field stores to huts further south down the island — something which will spare the shore party a good deal of coolie work, because weather conditions did not allow the operation to be done by helicopter while the relief ship "Thala Dan" was there a few days earlier. All too soon the time came to leave, and as "Solo" was the last ship to call until next summer, we took the last mail back to Australia.

The final leg of the voyage back to Sydney took a further toll of torn sails and battered railings, but the progressively warmer temperatures made deck work more pleasant, especially when it became possible to dispense with wearing gloves and bulky clothing. After 79 days the voyage ended on 4 March, 1978, when "Solo" returned to Sydney harbour.

RADIO OPERATIONS

Marine Radio

For the first week from Sydney, all radio contact was made on marine radio chanels through OTC coastal stations, including Sydney, Melbourne, Hobart and Adelaide. The contacts became weaker as "Solo" drew away from Australia, and ceased altogether beyond 50°S. The highest frequencies available for radiotelephony to the coastal stations were in the 6 MHz range, and our signals too often could not compete with QRM on the crystal locked frequencies.

It is difficult to speak too highly of the sustained effort made by radio operators of the coastal stations (many of them also amateur operators in their own right) to keep contact with "Solo". At times both Sydney and Melbourne stations would listen, each receiving different parts of messages from "Solo" when conditions were very difficult, and would compare notes. From 28 December, 1977, until 22 February, 1978, all commercial traffic through the OTC was relayed via the Antarctic or sub-Antarctic research stations at Davis, Macquarie Island and Campbell Island. Direct contact with Sydney or Melbourne coastal stations was resumed from 23 February until the end of the voyage.

One disappointment concerned the use of a 12 MHz radfone channel, for our signal was always declared to be "noncommercial" by the telephone operators in Sydney. This was despite the fact that the Stingray transceiver was working well on that frequency, as proved by a test transmission to Davis, where Col Christiansen reported good signal strength and excellent clarity. Perhaps ocean liners such as the Queen Elizabeth II or the Arcadia, which were in contact with Australia on the same frequencies, had more powerful transmitters.

Radio interference was always far more troublesome on the fixed marine radio frequencies than it was in the amateur bands, where it was usually possible to change to a different frequency. The various generators on board were not properly suppressed, and although noise blankers on the receivers were useful, the best solution was to cut the exciters from the generators, especially when working the lower frequencies. Sometimes when motoring, even that was not sufficient, and it was then better if possible to stop the engine, because apart from electrical interference, the motor was noisy inside the cabin.

Amateur Radio

Amateur radio transmissions did not begin until six days after leaving Sydney. This was to conserve the radio batteries until proper provision had been made for charging them. Jack Pittar installed a system of relays which switched the two 12V radio batteries in parallel while the radios were used (—ve earth) and in series for charging in parallel with the +ve earth 24V main bank of batteries. At first it seemed this excellent arrangement was working well, but after a few days it became impossible to avoid doubts whether the radio batteries were receiving enough charging current, and these doubts remained after adjusting the regulators of the sailing/prop generator and the generator driven by the diesel engine.

Possibly the ship's main batteries of 180 ampere hours capacity, being older, charged at a lower voltage than the brand new radio batteries, so that the radio batteries never charged to their nominal capacity of 60 ampere hours each. Whether or not this was so, it became more and more certain that the radio batteries were starved, and from time to time as an experiment, the main batteries were isolated to pass all the charging current to the radio batteries. This could be done only in stable weather conditions, and it had to be made clear to the deck crew that the slightest touch of a foot switch for either of the sheet winches would blow out the relays.

These are simple enough matters to discuss in theory and with hindsight. But in practice, when the batteries are down in the bilges under large plywood floor panels, which in turn are under a heap of assorted boots and Honda generator with nowhere else to go, and when access to soldering irons and electrical equipment requires disturbing very tired crew members to reach lockers behind or underneath bunks, and when anything left unattended for a moment is hurled across the cabin by the next large wave, and when it is very soon again time for dinner or the next watch before much rewiring can be done, then such tasks become major and long undertakings. Jack also had a misfortune while cleaning the hydrometer on deck, when the glass cylindrical portion containing the graduated float decided to part company with the rubber suction bulb. He was naturally holding the rubber bulb with due care and attention, but the rest of the hdyrometer most exasperatingly began an irretrievable journey to the bottom of the Southern Ocean.

The symptoms during skeds on the Atlas were decreasing power output, progressively higher SWR ratio, and of course reports of declining signal strength and intelligiblity during a QSO. But the Atlas has a protective mechanism whereby power is reduced at higher SWR, and the aerial of necessity passed through numerous connectors and a coax switch, to share duty for the Drake communications receiver, or the Stingray marine radios. So the aerial system for a while also had to be regarded as a possible source of trouble, but curiously the aerial always tuned nicely with 1:1 SWR at the beginning of skeds.

Naturally the amateurs at the receiving end would then suggest that both stations should change to CW. Now the "ham shack" area in "Solo" was on top of a large locker containing wet weather gear, beside which one stood none too securely on the starboard side of the cabin, in a posture which depended very much on which tack "Solo" was sailing. On starboard track the radio cupboard was "uphill" and there was a recurrent tendency for log books or message pads to be hurled on to the floor. On port tackle that was less of a problem, but then occasionally an uncongealed cheesecake would flip across from the port side galley into the radio area or else seawater would spill in from a ventilator.

It is one thing for a tenderfoot morse operator to take CW on a message pad letter for letter seated at a steady desk on land. It is quite something else to do it standing in a small boat at sea with one hand preoccupied holding on to a bulkhead, and the other occasionally fielding message pads, etc., before they escape over the edge of the working area. Sending CW was less of a problem than receiving, because the HK706 morse key has an excellent rubber base and slung to the work area. I found it distracting at first not to have side tone, for I had never practised sending morse without an audio oscillator. For all these problems, it was very fortunate that the Atlas transmitted clearly if weakly on CW, after radiotelephony had become quite unintelligible, and other stations always reported excellent tone on CW.

A few operators reported distorted modulation during some of the earlier phone contacts, and this raised further doubts about the ALC setting or the microphone. Changing microphones often led to a temporary improvement; with hindsight this was not so much because the previous microphone was malfunctioning, but probably because the batteries recovered somewhat before transmission resumed. Battery voltages were always excellent when tested before skeds, but the true state of the radio batteries became more evident after one particularly difficult sked, when the two radio batteries, each of nominal 60 ampere hour capacity, gave 8V. Incredibly, the Atlas was still transmitting readable CW!

At the same time, however, another potentially serious problem lay in the decreasing temperatures, which had fallen to about 2° or 3°C inside the cabin. Steam from cooking in the galley happily filled the cabin and condensed profusely on any cold surfaces, and microphones which unavoidably became damp failed to dry out.

Fortunately there was no overall shortage of electric power from the free-wheel prop generator or from the diesel engine when moving under power, and this led to a much simplified method of charging the radio batteries, which at the same time countered the cold-wet environment for the Atlas and its accessories. The radio batteries were now left in parallel, and

two 12V light bulbs of about 12 watts each were wired in parallel, giving a resistance when hot of about 6 ohms. These bulbs were mounted low inside the cupboard housing the Atlas, and were used as a dropping resistor to charge the radio batteries at current of 2 amps from the ship's main 24V batteries.

The beauty of this simple arrangement was the certitude that if the bulbs were shining, the radio batteries had to be charging. At the same time the Atlas and associated gear (especially the microphone) warmed up to about 11°C inside the cupboard, and this kept the rig dry when conditions were damp or even positively wet in the cabin. One of three multimeters on board was mounted on a bulkhead and wired to continuously measure the voltage of the radio batteries. This, without the services of the lamented hydrometer, helped to monitor the condition of the radio batteries.

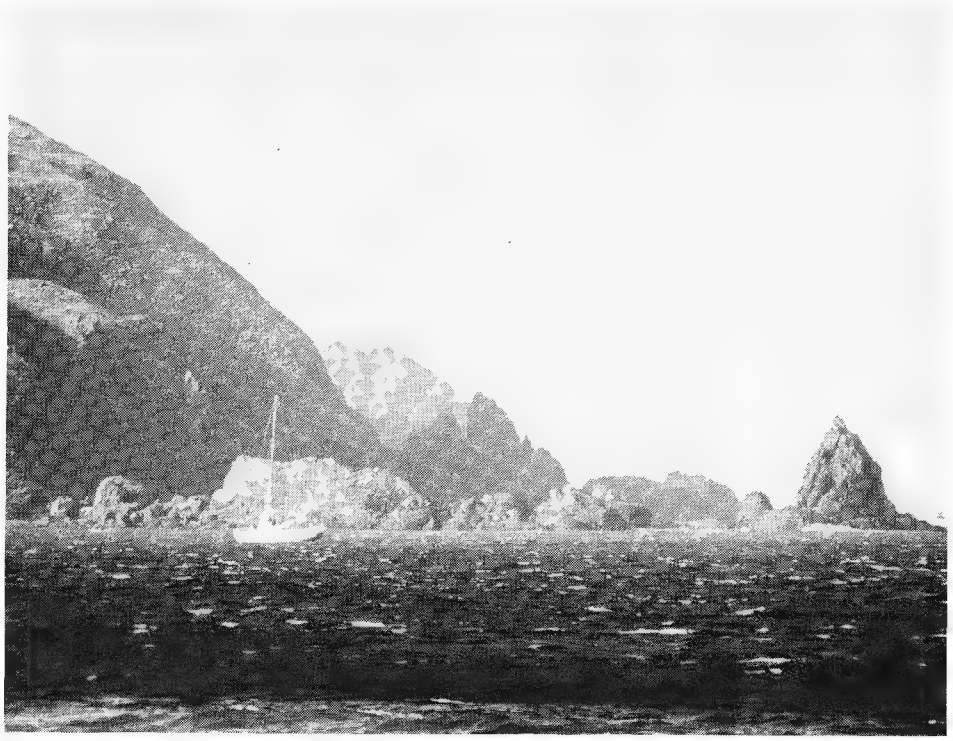
By mid-January, normal performance of the Atlas, with 1 : 1 SWR right across the 20m band, full power output, and excellent signal reports for readability (5) and strength (at time peaking over 9), all confirmed that the earlier problems had their origin in the chronically starved condition of the radio batteries. There were still some vagaries of propagation and perhaps occasional Antarctic flutter, but good contacts became the rule rather than the exception.

Although no attempt was made to operate DX for its own sake, it never proved necessary to close VK1PA/MM while other stations still wished to make contact. Perhaps a VK1 operating mobile marine outside Lake Burley Griffin was too much of a rarity to be recognisable as an unusual contact, yet at Cape Adare "Solo" was about 200 miles further south than any of the VK0s at the ANARE stations.

Over 200 amateur contacts were made during the voyage — 130 of them with six stations (VK0CC, VK1BH, VK1DL, VK1GB, VK2AAB and VK2HH).

It was often apparent that other amateur stations were listening on the side, without calling, and this was much appreciated as it strengthened surveillance of the expedition when it was working in very isolated waters.

The first amateur contacts were made on 21 December, and included an excellent QSO with Colin Christiansen (VK0CC) at Davis. Colin had the advantage of the gain of a large rhombic antenna in a very quiet area, and was often able to hear my signals better than at amateur stations in Australia. He therefore often took control of a radio net which evolved initially with other stations in Sydney and Canberra, and later extended to Ballarat, Victoria. Daily contact was attempted every evening except for one day while I was ashore on Sturge Island in the Balleny Group, and for six days when the net was suspended while "Solo" was at or near Macquarie Island. Of the sixty-six remaining days, there were only six when attempts to make amateur contact failed for technical reasons which originated either with the radio batteries or through difficulties with propagation on the 20m or alternative bands.



"Solo" at anchor in Buckles Bay, Macquarie Island. On the left the slopes rise towards Wireless Hill, the site of Sir Douglas Mawson's radio masts for the relay station for communication to Commonwealth Bay on the Antarctic Mainland.

Under circumstances where the value of amateur radio lay so much in reliable daily communication, it is perhaps invidious to identify any specific QSO, but it was a memorable day when an hour-long contact was made with VK2HH aeronautical mobile (Harry Hocking) on a QANTAS Boeing 747 which at that time was flying over Cape Adare where "Solo" had called a week earlier. Wives and friends of the crew on "Solo" were in the aircraft, and enjoyed the chance to talk to each other through the amateur radio service.

Nearly all of the amateur contacts were made in the 20m band, although the 80, 40 and 15m bands were also worked, in all instances using the longer of the two aerials. On the final return leg to Sydney, "Solo" made extremely fast progress across the Tasman Sea, and before arrangements had been made to use alternative frequencies in the 40 or 80m band, it was discovered one evening that all the usual east Australian stations of the net could not be heard on 20m, and presumably lay inside the skip zone. Fortunately a VK6 station was in 20m contact with one of the VK1s and was able to QSP an alternative frequency to be used in the 40m band.

Communication with Antarctic Research Stations

After "Solo" lost contact with the OTC coastal stations in Australia, the only means of passing official third party traffic was by relay through Antarctic research stations. It was known in advance that two of the frequencies allocated to ANARE stations were accessible on the Atlas, and appropriate consultation was made beforehand. Naturally other ANARE traffic took precedence, but with prior amateur radio contact, it was possible to confirm whether the ANARE frequencies were free.

Colin Christiansen, as the operator of radio VLZ Davis, was therefore able to relay messages to Australia, and also to the United States Fleet weather facility via McMurdo Station. This made it possible to despatch ship wireless weather reports from VJ6764 "Solo", and to receive ice forecasts from the Americans. Unfortunately there was no amateur operator at Macquarie Island, and it therefore proved harder to maintain effective long-range communication with Macquarie Island, except paradoxically by relay through Davis.

The final contact with Colin was on 12 January, when the Davis 1977 party returned to Australia, but the new radio operator and the previous radio technical officer, who stayed on at Davis for the summer, continued to work "Solo" until 7 February. Davis station therefore played a key role for more than half of the voyage on "Solo". Radio traffic and weather reports were relayed from 8 February through Macquarie Island, until

"Solo" anchored there, and again for a few days after leaving Macquarie Island. Good contact was also made with the New Zealanders at radio ZLBC Campbell Island, and continued for several days after contact was lost with Macquarie Island. From 23 February, direct contact was resumed with Sydney and Melbourne coastal stations, until the end of the voyage.

Social radio contacts were also made with the ANARE relief ships "Nella Dan" and "Thala Dan".

Ship-to-Shore Communication

The hand-held 27 MHz equipment gave good contact between "Solo" and parties going ashore in the inflatable rubber dinghy. One of the four sets was put out of service by saltwater immersion when the rubber dinghy was swamped during a fairly rough landing through heavy surf.

Satellite Buoy

The CSIRO's satellite buoy, named "Snow Petrel" apparently functioned throughout the voyage, so it was possible after the voyage to compare the satellite positions with those obtained by the traditional methods of celestial navigation.

Radar

"Solo" carried marine radar with a range of 24 miles. The scanner was mounted on the mizzen mast, and the screen and control unit was in the cabin, located above and even nearer to the galley than the radios. Although working normally before departure from Sydney, the radar unfortunately did not operate for most of the voyage, including all the time in fog-bound waters off the Balleny Islands, where there was much pack ice.

Jack followed the trouble-shooting procedures in the manual — which involved some work inside the scanner unit up the mizzen mast, but this was not successful. On the return journey near Macquarie Island, Jack found a resistor which must have been overheated earlier, for it had become open circuited through desoldering. The fact that the radar set performed perfectly after the resistor was soldered back in position (apart from continued overloading of this component) speaks very highly of the equipment, which had been enveloped every day by steam from the galley.

SUMMARY AND CONCLUSIONS

1. A heavy shibboleth still cited with conviction by some latter day ancient mariners, is that HF radio is utterly untrustworthy and unnecessary on board cruising yachts. The voyage on "Solo" lasted for 79 days. During the voyage, HF communication to Australia and/or Antarctica was made on 79 of those days.
2. Morale, not only on board "Solo", but also among friends and relatives in Australia was greatly helped by radio communcation. The ice forecasts received by radio were of crucial assistance to navigation in the fog-bound waters off the Balleny Islands.

Stingray Marine Radio Equipment on board "Solo", provided by Findlay Electronics.

3. Time was so short after the purchase of "Solo" that not all of the radio installation work was finished before departure. Apart from the extra effort it took to complete the work at sea, the shortage of time also meant accepting some compromise on the position where the radios were installed. It would have been vastly preferable if the radios could have been mounted to allow the operator to sit securely, or even lie in a bunk, instead of standing.
4. In the cold and wet conditions of high latitudes at sea, it is essential to house non-marinised amateur radio equipment in a weatherproof cupboard with provision for heating. The better insulated the cupboard, the less power will be required for heating. Apart from attention to power supplies and aerials, nothing else will help so much towards enjoying good performance from amateur radio transceivers, and communications receivers in small ships at sea.
5. Radio-telephony is very convenient and preferable to use when conditions are good, but many of the contacts would have failed without telegraphy. Possibly as much as half of the traffic to Davis was passed by CW.
6. A long wire aerial works extremely effectively at sea over salt water, when properly tuned with an aerial coupler.
7. The precaution of taking alternative whip antennas and a reserve amateur transceiver was entirely justified, although no emergency arose requiring their use.
8. The legal restrictions on third party traffic through the amateur service seemed especially inappropriate at the time "Solo" was out of direct communication through commercial channels to Australia. When third party traffic did reach relatives and friends in Australia, the news was spread by cascades of trunk telephone calls in Australia. If radio relay rights were explicitly granted to the amateur service in Australia, the net result without doubt would be a further increase to the already handsome profits of Telecom.
9. As a newcomer to the amateur service, may I again acknowledge the friendly advice and useful information from "old hands", without which I should have been much less likely to have obtained the necessary qualifications and suitable equipment to operate a maritime mobile amateur station.
10. May I record my heartfelt thanks to all the radio operators who worked "Solo", whether in the amateur service, the OTC coastal stations or at Davis, Macquarie Island and Campbell Island. Their skills and persistent application contributed very much to the success and welfare of the expedition.

Reproduced by permission from Forward Bias, June 1978. ■

QSP

IMPORT BAN ON "ILLEGAL" CB RADIOS CONSIDERED

The Federal Government may ban imports of "illegal" Citizens Band radio sets into Australia, the Minister for Post and Telecommunications, Mr. Staley, said. He said it was wrong that CB radios could be imported when they could not be licensed.

"I have had some discussions with the Minister for Business and Consumer Affairs, Mr. Fife, on what action could be taken to end what in general is an undesirable practice", he said, replying to a question without notice from the Deputy Opposition Leader, Mr. Lionel Bowen.

Mr. Bowen asked about a decision by Mr. Staley's department last December to license 20,000 CB sets imported from Taiwan for Australian General Electric. Mr. Bowen wanted to know who authorised importation of the sets, in view of their technical inferiority and the fact that they cause severe interference to normal radio and television reception.

Australian General Electric had made $1 million from sales of the sets, he said.

Mr. Staley said he was not familiar with the matter and would make enquiries.

UK LICENCE FEE

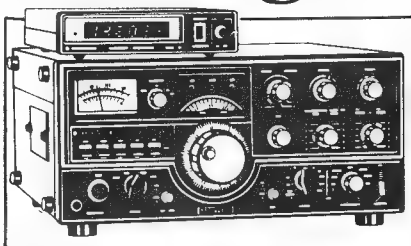
From 1.2.1978 the annual licence fees were increased by 16 per cent. The amateur licence becoms £6.40 which is approximately equivalent to $A10.40 at present exchange rates. Annual licence fees for some of the other services are now £2.80 for model control, £6.40 for ship licences, £4.60 for aircraft licences and £7.50 for each of the first two private mobile radio stations and £4.20 for each subsequent station. ■

Are you checking our bands for

INTRUDERS

AND REPORTING SAME TO THE INTRUDER WATCH CO-ORDINATOR?

All rigs pre-delivery checked!



KENWOOD TS-520S SSB transceiver

TS-520S features: • 160 thru 10 meter coverage • Optional DG-5 frequency display (on top of unit) • New speech processor with audio compression amplifier • Built-in AC power supply (DC-DC converter, optional) • RF attenuator

789.00

KENWOOD

SM220 station monitor	$335.00
AT200 antenna tuning unit	$185.00
TS820S HF transceiver with digital display	$1279.00
SP820 matching speaker plus filters for TS820	$66.00
VF0820 matching VFO for TS820 series	$179.00
DS-1A dc/dc converter for TS820S/TS520S	$79.00
TS520S HF transceiver 160-10m	$789.00
VFO520S matching VFO for TS520S transceiver	$155.00
SP520 matching speaker for TS520S	$39.90
DG-5 digital display for TS520 series	$206.00
TV506 6m transverter	$236.00
TV502 2m transverter	$245.00
TV502S 2m transverter	$290.00
TS700SP 2m all-mode transceiver	$899.00
VOX-3 VOX unit for TS700 series	$25.00
TR3200 70cm fm portable transceiver	$229.00
TR7400A 2m digital mobile fm transceiver	$499.00
TR7500 2m synthesised fm transceiver	$399.00
R-300 general coverage communications receiver	$260.00
MC-50 desk microphone	$58.00
MC-35S ptt hand mic, high Z	$20.00
HC-2 Ham world clock	$34.00
TL922 HF linear amplifier	POA

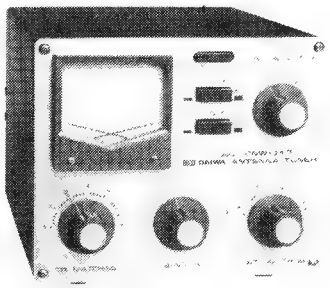
ICOM

IC701 HF solid-state 160 10m transceiver	$1180.00
IC701PS matching pwr supply/speaker	$245.00
IC202E 2m ssb portable transceiver, 3 watts	$219.00
IC502 6m ssb portable transceiver, 3 watts	$219.00
IC22S 2m fm synthesised mobile transceiver	$299.00
IC211 2m all-mode ac/dc transceiver	$785.00
IC245 2m fm digital mobile transceiver	$465.00
ssb adapter for above	$142.00
RM3 remote controller for IC701/211/245	$169.00
BC20 nicad pack incl charger for portables	$59.00
ICSM2 condenser electret microphone (base)	$56.00
IC50L 6m 10w linear amplifier	$98.00

DAIWA HAVE RELEASED A NEW RANGE OF QUALITY ANTENNA TUNERS WITH CROSS-NEEDLE SWR/PWR METER

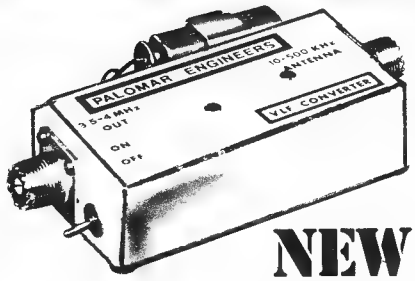
MODEL **CNW-217**
Freq coverage : 1.8 thru 30MHz
Input power : 100w CW, 200w pep
Input impedance : 50 ohms unbalanced
Output impedance : 10-300 ohm unbalanced
Price : **$179.00**

MODEL **CNW-417**
1.8 thru 30MHz
200w Cw, 500w pep
50 ohms unbalanced
10-300 ohms unbalanced
$219.00



VLF CONVERTER

NEW



NEW

- **New device opens up the world of Very Low Frequency radio.**
- **Gives reception of the 1750 meter band at 160-190 KHz where transmitters of one watt power can be operated without FCC license.**
- **Also covers the navigation radiobeacon band, standard frequency broadcasts, ship-to-shore communications, and the European low frequency broadcast band.**

The converter moves all these signals to the 80 meter amateur band where they can be tuned in on an ordinary shortwave receiver

The converter is simple to use and has no tuning adjustments Tuning of VLF signals is done entirely by the receiver which picks up 10 KHz signals at 3510 KHz, 100 KHZ signals at 3600 KHz, 500 KHz signals at 4000 KHz

The VLF converter has crystal control for accurate frequency conversion, a low noise rf amplifier for high sensitivity, and a multipole filter to cut broadcast and 80 meter interference.

All this performance is packed into a small 3" x 1½" x 6" die cast aluminum case with UHF (SO-239) connectors

The unique Palomar Engineers circuit eliminates the complex bandswitching and tuning adjustments usually found in VLF converters. Free descriptive brochure sent on request.

89.00 Call for yours today.

TRAP VERTICALS

NAGARA V4Jr 40-10m, 5.2m high, no guys	$99.00
NAGARA V5Jr 80 10m, 6.7m high, no guys	$139.00

TRAP DIPOLES

RAK Midy VN 80-10m trap horizontal, 23m long	$103.00
RAK AL48DXN 40/80m trap dipole	$62.00

JAYBEAM ANTENNAS

88/70 88 el for 70cm, 18.5dBd gain	$99.00
48/70 48 el for 70cm, 15.7dBd gain	$76.00
PBM18/70 18 el, 70cm, 14.9dBd gain	$69.00
D8/70cm twin 8 el for 70cm, 12.3dBd gain	$59.00
5Y/2M 5 el 2m, 7.8dBd gain	$35.00
8Y/2m 8 el 2m, 9.5dBd gain	$45.00

DISCONE ANTENNA

GDX-1 80-480MHz commercial discone	$79.00

PARABOLIC DISHES

Daiwa PBA-1200 70cm and 1.2GHz, complete	$249.00

SCALAR

M22T	¼ wave 2m mobile whip, top only	$7.00
M25	5/8 wave 2m mobile whip. top only	$17.50
—	base for above	$4.00

VALVES

6JS6C	for FT101 series	$12.00
6146B	for Kenwood, Uniden	$13.00
6KD6	for early Yaesu linears	$13.00
572B	for Yaesu linears	$55.00

bankcard DINERS CLUB AUSTRALIA

TRADE-INS ACCEPTED

accessories

PROCESSORS & COMPRESSORS

RF440 Speech processor, phasing type, 6dB gain	$125.00
RF550 Speech processor, crystal filter type	$165.00

MORSE KEYS

HK702 deluxe key with marble base	$38.00
HK708 economy key	$21.00
HK706 operator's key	$25.00
MK701 sideswiper manipulator	$43.00
EK103Z electronic keyer	$165.00
IC KEYER (Palomar)	$149.00

MICROPHONES

VM-1 noise-cancelling, dynamic, low Z	$9.50
VM-2 desk mic with pre-amp, dynamic, low Z	$29.80

SWR/PWR METERS

VC2 twin meters, 3-150MHz with calibration chart	$34.00
Oskerblock SWR200 3-200MHz, 2/20/200/2000 watts	$75.00
SW410A VHF-UHF, quality direct reading	$105.00
SW210A 1.8 thru 150MHz, 20/200w, direct reading	$85.00
SWX777 professional 1.8 thru 30MHz, direct reading	$131.00

ANTENNA CHANGE-OVER RELAYS

CX-2L 1.8 thru 170MHz, 100w pep max	$45.00
CX-2H 1.8 thru 450MHz, 200w pep max	$59.00

COAXIAL SWITCHES

CS201 2 position, high pwr, up to 500MHz	$24.00
CS401 4 position, high pwr, up to 500MHz	$49.90

LOW PASS FILTERS (DAIWA)

FD30M 32MHz Fc, 1Kw, 3 stages, good quality	$33.00
FD30LS 32MHz Fc, 200w, 3 stages, good quality	$20.00

NOISE BRIDGES

Omega TE7-01 up to 100MHz	$44.00
Palomar up to 100MHz	$79.00

QM70 PRODUCTS

CONVERTERS:	(28MHz IF)	432MHz	$59.00
		144MHz	$59.00
		1296MHz	$70.00
	(144MHz IF)	432MHz	$59.00
TRANSVERTERS:	High pwr, "SCORPION", 28MHz IF		$225.00
	2m/432MHz		$125.00
LINEARS:	2m 70w pep max		$129.00

2m ANTENNAS

The **RINGO RANGER ARX-2** is a 2M gain omni-directional antenna with three half-waves in phase and a one-eight wave matching stub. The Ringo Ranger gives an extremely low angle of radiation for better signal coverage. It is tunable over a broad frequency range and perfectly matched to 52 ohm coax. Price **$49.**

RINGO

Head Office and Mail Orders.

vicom

Ph (03) 699.6700

68 Eastern Road

TLX 30566

Sth Melbourne Vic. 3205

Direction: Russell J. Kelly
Peter D. Williams

Adelaide 43.7981 Canberra 82.3581 Perth 446.3232 Brisbane 38.4480 Hobart 43.6337.

sydney customers:

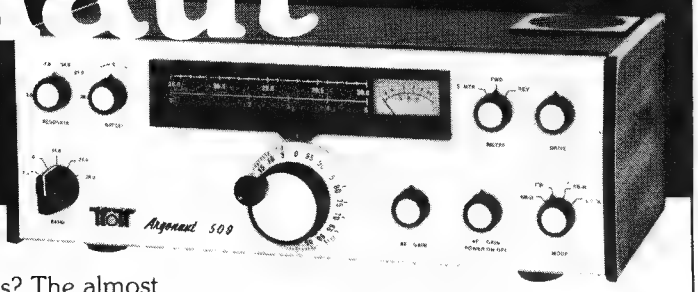
Our Sydney Area Dealer is:

CUSTOM COMMUNICATIONS
TELEPHONE: 632.3744

Who will be happy to supply the VICOM Product Range including quality ICOM Transceivers.

An invitation to join the TEN-TEC

"Argonaut Club"



TEN-TEC Argonaut 509

Tired of push-button QSOs? Had it with the KW killers? The almost too easy life of power hamming? Then the excitement of Argonauting is for you. The QRPp world is different. A challenge? Of course. The test of an operator? Perhaps. But above all it is the thrill of working the world with 5 watts.

The Argonaut club is exclusive, not everyone is a member. But if you enjoy the spirit of conquering distance with lower power, you are "in." There are no dues — just the price of an Argonaut.

Join the thousands of fellow members in the Argonaut club, get in on the Argo fun. Your membership awaits you at your Ten-Tec dealer.

SPECIFICATIONS:
Five band: 3.5-30 MHz. SSB and CW modes. ½μV receiver sensitivity. 5 watts transmitter final input. Fully solid-state. Permeability tuning. Instant break-in. Instant band change without tune-up. Receiver offset tuning. Automatic sideband selection, reversible. Direct frequency readout. Built-in SWR bridge. S-Meter. WWV receive. Internal speaker. Plug-in circuit boards. 12-14 VDC or AC supply power. Wt. 6 lbs. Size HWD: 4½" × 13" × 7".

509 ARGONAUT TRANSCEIVER	$405.00
215-P CERAMIC MICROPHONE	$ 45.00
A.&R. PS-353 P. SUPPLY	$ 38.00

Of Course . . . You can Add the Matching Linear Amplifier in the Future. Please Phone, Write or Call, for Further Particulars of the Range.

graham e. stallard
27 WHITE AVE. LOCKLEYS 5032
SOUTH AUSTRALIA — PHONE 43 7981

Authorised Australian Distributor for
TEN-TEC

Sideband Electronics Sales

DISTRIBUTORS OF COMMUNICATION TRANSCEIVERS

NEW! SKY-BAND MOBILE ANTENNAS

THIS NEWLY DESIGNED UNIQUE MOBILE ANTENNA HELICALLY WOUND EXTRA HEAVY DUTY. SIX FEET LONG, AND CAN HANDLE UP TO 400 WATTS P.E.P.

FEATURES:
Light weight.
S.W.R. better than 1: 1.05 at resonance
Covered with highest grade fireproof insulation
Chrome base with 3/8 24 tpi. thread
Available in colours, grey, white, blue, green burnt orange, brown and black.

AVAILABLE:
SKY. 80M 3.5 Special Novice 3.65
SKY. 40M 7.06
SKY. 20 14.150
SKY. 15 21.100 and up.
SKY. 10 28.5 and up.

PRICE LIST:

SKY 80 6 feet long 3.5 MHz	$28
SKY 40 6 feet long 7.060	$26
SKY 20 6 feet long 14.150	$26
SKY 15 6 feet long 21.100	$25
SKY 10 6 feet long 28.500	$24
Swivel mounts and chrome plated springs for all	$13

All Sky-Band Antennas are carefully designed and have been individually tested. High quality fibreglass rod, wound with optimum thickness of wire to keep weight down, but maintain High Q. An elegant design to those who only want the best. All antennas are factory tuned for the lowest portion of the desired band and can simply be trimmed for your chosen frequency. Yes it is allAustralian made! You don't pay for large overheads, instead we use the best material available and offer a mobile antenna which will resonate to our frequencies, unlike the previous overseas designed antennas.

ORDER NOW AND SPECIFY THE COLOUR YOU REQUIRE

New designs on the way similar to the famous 'Band Spanner' from 80-10 metres, tunable centre loaded, to be released soon.

SEND FOR A FREE CATALOGUE AND PRICE LIST

SALES & SERVICE 24 KURRI ST., LOFTUS. N.S.W. P.O. BOX 184, SUTHERLAND. 2232 | OPEN SATURDAYS TILL NOON. Phone: 521-7573

TEST REPORT

We Don't Claim That Your **ALPHA** Linear Will Run A Kilowatt Key-Down FOREVER . . .

. . . *But We Don't Put A Time Limit On It, Either.*

YOU'LL PROBABLY NEVER SET A BRICK ON YOUR KEY FOR 26,000 MINUTES, BUT WE DID IT TO ILLUSTRATE WHAT ETO'S NO TIME LIMIT [NTL] CONTINUOUS DUTY RATINGS REALLY MEAN TO EVERY **ALPHA** AMPLIFIER OWNER.

April 7th: A standard **ALPHA 76** was taken from production, loaded up to a full 1000 watts key-down dc input, and left operating with a brick on the key.

April 25th: The '76 was still operating completely normally, delivering about 675 watts of continuous rf carrier output into a very hot dummy load — after 18 days — 435 hours — some 26,000 consecutive minutes key-down at a full kilowatt. You may have seen the same unit running key-down all day long the following week-end at the Dayton Hamvention. It's still as good as new — a fact which will surprise no one who knows how all **ALPHA's** are built. You'd expect no less.

The point is, every **ALPHA** linear amplifier — including the power- and value-packed **ALPHA 76** and the exclusive NO-TUNE-UP **ALPHA 374** — is meticulously engineered and built to handle continuous operation IN ANY MODE AT MAXIMUM LEGAL POWER [NTL] . . . No Time Limit.

MODEL 76P **ALPHA** MODEL 374

LINEAR HF AMPLIFIERS

ALPHA: SURE YOU CAN BUY A CHEAPER LINEAR . . . BUT IS THAT *REALLY* WHAT YOU WANT?

A LINEAR AMPLIFIER IS A BIG INVESTMENT . . . MAKE IT WISELY. For an enlightening glimpse at what goes into the design of every **ALPHA** *by ETO's power professionals, or to aid you in comparing one linear with another, call or write for our brief guide entitled, "EVERYTHING YOU ALWAYS WANTED TO KNOW ABOUT (COMPARING) LINEARS . . . BUT DIDN'T KNOW WHOM TO ASK." We'll also send you fully detailed and illustrated literature describing the entire ETO line of superb* **ALPHA** *power amplifiers and ALPHA/VOMAX — the new split-band speech processor that's your key to rf clipper type "talk power" combined with easy mike-line installation and low-distortion, practically foolproof operation.*

AUSTRALIAN SOUND AND SIGNAL RESEARCH

P.O. BOX 5076 G.P.O. SYDNEY 2001

Enquiries: **JAMES GOODGER VK2JO. TELEPHONE SYDNEY (02) 36 7756**

EQUIPMENT REVIEW:
THE ASTRO 200 SSB TRANSCEIVER

When Peter Schultz of Sideband Electronics Sales, Loftus, NSW, offered us an ASTRO 200 transceiver to try out, we quickly accepted. In spite of quite extensive advertising in Amateur Radio magazine, the ASTRO seems to be almost unknown amongst active amateur operators. Introduced into this country with a full page advertisement in the November 1976 issue of AR and followed with a double page spread in the March 1977 issue, it must remain a mystery just why this is so.

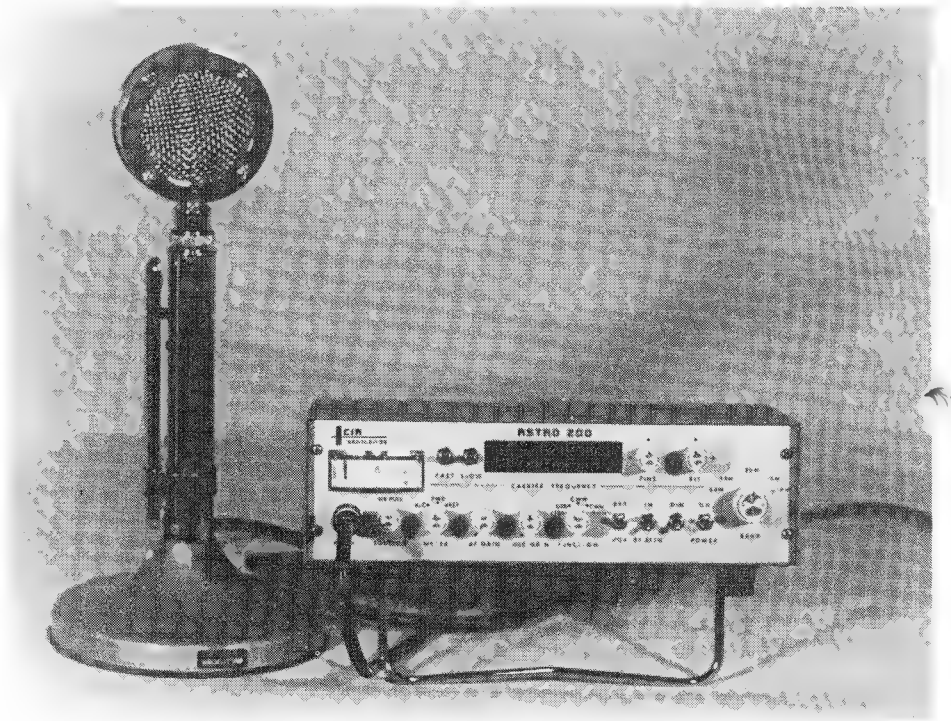
Well, just what is the ASTRO 200? In a few words, it is a miniaturised 100 watt output 80 to 10 metre transceiver with fully synthesized tuning. There is a lot more to be told, of course, but before that, let's go back a few years and look at the development of the amateur band transceiver as we know it today. One would be excused for thinking that the amateur transceiver was a Japanese invention and had been developed to its present state in that country.

Not so. The transceiver was devised in the United States and to date every new development in its history has come from the United States. This of course infers that the ASTRO is a product of the United States, which it certainly is. The manufacturer is CIR Industries Inc., of California. However, let's get back to the transceiver itself and see just what sets it apart from the others. Two things stand out straight away. Tuning is fully synthesized, that is, the bands are covered in 100 Hz steps rather than continuously as with a conventional VFO system. The manufacturer claims that the ASTRO has 40,000 channels. He is probably right, but we didn't count them.

The next and probably the most revolutionary development is that there is no conventional tuning system. Tuning is accomplished by a scanning device operated by spring loaded switches. A fast and slow scanning rate is provided to enable either quick excursions from one portion of the band to another for easy SSB resolution.

Reference to the illustration will give a good idea of its relative size. The Astatic D-104 microphone looks huge in comparison. The actual dimensions of the ASTRO are 7.2 cm high, 30.8 cm deep and 24.13 cm wide and the weight only 3.6 kg. There is of course no AC power supply built in, the transceiver being designed primarily as a mobile unit or for home station use with an external high current DC supply. Nominal operating voltage is 12 to 14 volts.

As there is no conventional tuning system it follows that the frequency readout is digital. A six digit readout gives 100 Hz resolution. The brightness of the readout can be reduced for night time operation.



Most of the usual facilities we expect to find in modern transceivers are included in the ASTRO. These include: VOX or PTT, built-in SWR meter, noise blanker, RF attenuator on receive, fine tuning control or VXO to tune between the 100 Hz points, a separate receiver offset tuning control and an entirely separate WWV receiver on 10 MHz. Perhaps one of the more interesting features is the inclusion of an in-line RF power meter to actually read the output power in watts.

TECHNICAL FEATURES OF THE ASTRO 200

From the above it is obvious that the ASTRO is no run-of-the-mill transceiver, so a closer look at the circuitry is of great interest.

The set is made up with good quality plug-in circuit boards and the overall internal appearance is clean and orderly. At a guess it would seem that the manufacturers, CIR Industries, have a background of high quality commercial manufacture. The receiver is a single conversion design with a 5.6 MHz IF frequency. Gain in front of the 8 pole crystal filter is kept low with a dual gate MOS FET RF stage driving a double balanced mixer stage. PIN diodes are used in the AGC circuit and a dynamic range of greater than 100 dB is claimed. The switched RF attenuator increases this to over 120 dB. Perhaps an unusual omission, however, is a normal RF gain control and a strange inclusion is a squelch control. The eight pole filter has 1 : 8 shape factor with a 2700 Hz bandpass at the 6 dB points, and 4900 Hz at the 60 dB points. Diode switching is employed in selecting either the SSB or CW filter. The well known LM-380 is used as the receive audio output chip.

RF bandpass filtering is switched into the receiver front end with the transceive band switch, and as is common with modern solid state design, no peaking or front end tuning controls are provided or needed for either transmitter or receiver.

The transmitter line up is straightforward and uses the same 5.6 MHz filter as used in the receiver. The power output section uses three stages with the last two in push-pull. All the transmitter stages are broadbanded with separate bandpass filters switched in for each band. Considerable attention has been given to TVI suppression and general spurious output. Double balanced mixers are used throughout both transmitter and receiver, and in addition to the bandpass filters in the transmitter output and receiver input, a three section low-pass filter is included at the transmitter output.

Some form of speech processing is considered essential these days, and the ASTRO uses a very interesting approach. Incorporated in the microphone is a logarithmic compressor followed by a 3 kHz filter. The design then allows the final

transmitter stage to be over-driven to produce a degree of controlled RF compression. We shall see later just how effective this is.

The heart of the whole transceiver is of course the frequency synthesizer. In effect the synthesizer generates crystal controlled frequencies in 100 Hz steps for each of the amateur bands. The basis of all this is a very stable 5 MHz crystal oscillator driving two phase locked loops. The major PLL generates the heterodyne frequencies to convert the received and transmitted signals to and from the 5.6 MHz IF channel. This loop also generates the 100 Hz steps from a programming code and an up/down counter. The up/down counter is in turn controlled by the front panel frequency selecting switches.

THE ASTRO 200 IN OPERATION

Sideband Electronics Sales kindly loaned us a heavy duty 20 amp 13.8 volt power supply to use with the ASTRO. For home station use a similar type of power supply would be needed.

Used in the car, however, the average current drain over a period of time would be quite low. At 200 watts peak input the drain would be something over 15 amps, but as this would only occur on absolute speech peaks, the drain as measured on a normal ammeter does not exceed about six amps. With full use of the speech processor this would rise to about ten amps. Even so, a normal car battery in reasonable condition would operate the ASTRO for the duration of the field day and still start the car after.

When the ASTRO is first turned on, it takes several seconds for the PLLs to actually lock. During this time signals rush back and forth in random fashion. Tuning the ASTRO is a new experience and certainly takes time to master. The tuning switches are three position spring-loaded with centre normal. Fast tunes at a rate of 10 kHz per second, ideal for hopping from one end of the band to the other. Pushing the switches up increases the frequency, while pushing down has the opposite effect. The SLOW switch tunes at the rate of 400 Hz per second. After a few minutes practice one becomes expert and the whole thing becomes easy albeit strange to operate. While all this is happening the digital readout is showing the exact frequency.

Received audio quality was excellent and strong signal handling first class. As mentioned earlier no RF gain control is included. As a personal choice I would swap the squelch control for one. When listening to strong signals I normally prefer to reduce the RF gain and benefit from the quiet background so obtained. The RF attenuator included in the set did not provide this effect. However in all other respects the receiver was pleasant to operate. The noise blanker was effective on ignition type noise but did introduce some cross modulation particularly on the eighty metre band at night when signals can be extremely strong. The WWV receiver built in is definitely a "Why didn't they think of it before". A separate direct conversion receiver is used. That is direct from RF to audio. It can be selected at any time by the function switch and appears to be most effective. An internal preset trimmer allows the master 5 MHz oscillator to set spot on with WWV.

Perhaps one question that will come up is, what is it like tuning in 100 Hz steps? Is it possible to get an SSB signal spot on? The answer is a definite yes — even a fussy operator when it comes to getting the pitch right will be quite satisfied. Nevertheless, the ASTRO does include a FINE and an RIT control but as both of these only has a range of ± 50 Hz it seemed perhaps a waste of time to include them.

Most of the transmit tests were carried out on the twenty and eighty metre bands. Using a fair degree of the RF compression all DX contacts reported on the excellent audio. At the time of the tests, conditions were only fair, perhaps the best time to check transmit readability.

Power output was right up to specification with the built-in power meter agreeing with my usual station RF watt meter. In short, 100 watts on all bands from 80 to 15 and 90 watts on 10 metres.

SUMMING IT UP

Just where does a transceiver like the ASTRO fit into the scheme of things? There is no doubt that it would be an ideal mobile unit and also an ultra compact home station with a suitable power supply. Why, then, is it still largely unknown? I am sure that if amateurs could see one in action they would find it hard to resist, even at the rather high price they are selling for. Perhaps in relation to the advanced technology tied up in that small box, the price is not high at all. But maybe at this point some criticism could be stated. Unfortunately, the overall appearance and external finish does not match the price. There is no doubt that this is the point where most manufacturers throughout the world fall short of their Japanese competitors. Perhaps a little more time spent on good industrial design might have paid off with the ASTRO. I am sure though that in time we will see many of its features incorporated in amateur transceivers.

The instruction book supplied is well produced, but as is usual these days, does not include much information for the home repairer. A complete circuit running to nine pages is provided but no circuit board layouts are provided. A letter from Peter Schultz states the following. The Warranty is for 90 days from the date of purchase for faulty workmanship and parts except power output transistors. However, they are protected in the usual manner — read user's manual. Please also note this is a highly sophisticated transceiver. I do have service facilities for complete alignment, but at the moment changeover boards available if major faults occur, supplied by the manufacturer.

Further details on the ASTRO 200 can be obtained from the agent, Sideband Electronics Sales, 24 Kurri Street, Loftus, NSW 2232.

Specifications ex March 1977 AR. ■

CLOSE FEDERAL LOOK AT CB

CLOSE FEDERAL LOOK AT CB

The following is a direct copy of a story published in the Townsville Daily Bulletin on May 24, 1978.

Further details on the Ministerial statement are at present unavailable.

The Federal Government is looking closely at the "problems" and "absurdities" of CB radio.

The Post and Telecommunications Minister, Mr. A. A. Staley, said this in Townsville yesterday.

A questioner had said that "everyone has CB radio, and we are told that in 1982 CB radio as such will cease to exist". Would there be a problem in regard to changing the law?

Mr. Staley said it was unreal to think that in 1982 the hundreds of thousands of people with CB radios would suddenly find it was illegal to operate them.

"You would need a policeman in every street, and even then they wouldn't catch them," he said.

Mr. Staley said the policy on introduction of CB radio in Australia had been well intentioned, but the "difficulties it would lead to" had not been foreseen.

He said he was trying to produce a new set of regulations governing the use of CB, "and we are looking at that 1982 date".

"CB has great advantages for certain people in certain areas, such as people on the land, or living outside cities," Mr. Staley said.

"It's a toy for some in the cities, a plaything.

"But it causes no end of interference to pre-existing services such as TV."

Mr. Staley said it was an "absurd situation" where you can sell a set which you cannot licence.

"I want something done about that," he said.

"You can import sets which you cannot licence. This is madness again. It only introduces a state of lawlessness.

"CB is here to stay, but we have to have sensible regulations so that the life we all lead can be made a little more comfortable and contended," he said. ■

IMPROVING THE ATLAS 210X TRANSCEIVER

L. J. Brennan VK4XJ
12 Cornhill St., Kenmore 4069

The Atlas 210X must be one of the best mobile transceivers on the market today due to its small size, light weight, and solid state final. It covers five HF bands with an output of around 90 watts and operates directly from a 12 volt supply. However, it does have some limitations and the following notes may be of interest to other users.

SENSITIVITY

Although the specifications for the Atlas 210X state sensitivity to be better than 0.4 microvolts for a 10 dB signal-plus-noise to noise ratio from 80 to 20 metres, about 0.4 uV on 15 metres and 0.6 uV on 10 metres, the set under test did not meet this specification on 10 and 15 metres. In comparison with another older valve transceiver it did not show up very well on these bands, so the problem was taken up with the manufacturer.

The Customer Service Manager suggested peaking the receiver input coils, making sure the VFO injection voltage was at least 0.4 volt, and if the sensitivity was still down, that a pre-amplifier would be found helpful, especially on 10 metres.

RF PRE-AMPLIFIER

No RF stage is used in the Atlas ahead of the mixer stage and a pre-amplifier will be found to be a worthwhile modification. The circuit suggested by Atlas is shown in Fig. 1. It uses a 2N3866 and really improves the sensitivity of this transceiver especially on 10 metres. The sensitivity on this band is now around 0.3 uV for 10 dB signal plus noise to noise ratio. The extra gain also improves the operation of the AGC system which now works in a much more satisfactory manner.

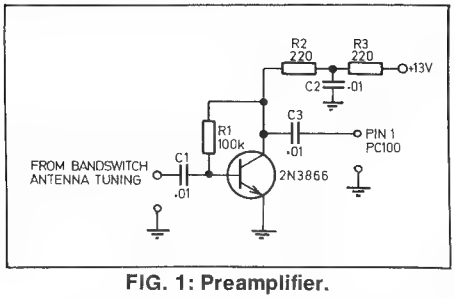


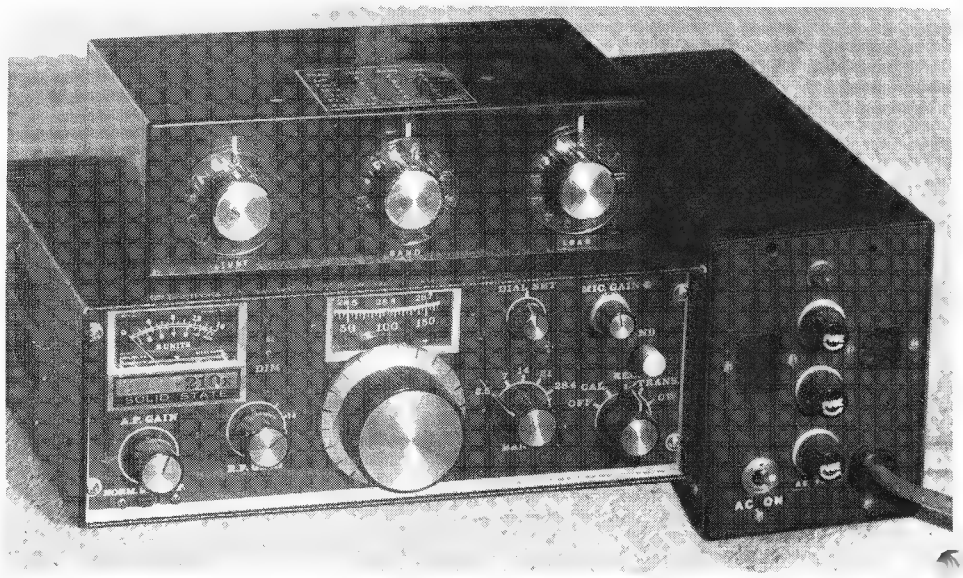
FIG. 1: Preamplifier.

The pre-amp was made on a small PCB by VK4UA and is about 2 inches long by 1 inch high. It could be made on a strip of Veroboard. It will fit the area of the Atlas PCB No 900, mounted at the top rear and using the two holes in this board to mount two 3/8 inch long stand-offs. The pre-amp fits neatly in place at the rear side of the dial drum.

The pre-amp is connected into the circuit by mini-coax between the band change switch for the antenna tuning circuits and pin 1 of socket for PCB No PC100. Plus 13 volts is taken from pin 10 of the socket for PC100. The ground connection is to the chassis nearby.

Due to the increased RF gain a resistor of 2,700 ohms is connected between the RF gain control R6— 10k ohms and R7 (470 ohms). The additional resistor is supported on a small tag-strip near the gain control. The circuit alteration is shown in Fig. 2.

It was also found desirable to reduce the range of the audio gain control by disconnecting the lead from pin 22 on PC 300C and connecting it to the moving arm of a 20k ohm tab pot connected between pin 22 and ground. The desired audio level can now be pre-set to give a better range for the audio gain control. See Fig. 3.



ATU and AC Supply.

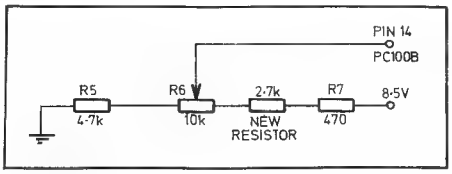


FIG. 2: Extra Resistor to reduce gain.

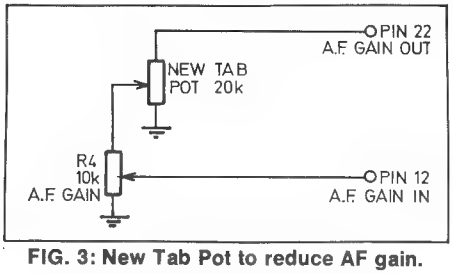


FIG. 3: New Tab Pot to reduce AF gain.

The gain was found to be too high on the lower frequencies. A pre-set mark about two thirds maximum permits adjustment for excessive RF gain and "S" meter readings on the lower frequency bands.

ANTENNA TUNER

The Atlas does not make provision for adjustment to various load impedances, and it will only deliver its maximum power when the load is between 50 and 53.5 ohms non-reactive.

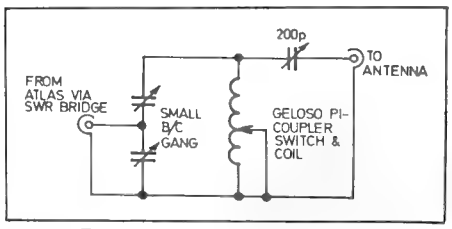


FIG. 4: Transmatch for Atlas.

Fig. 4 shows a circuit of a transmatch that has proved very satisactory, the inductance being a Geloso Pi-Coupler, C1, a small two gang broadcast tuning capacitor and C2 any single gang around 200 pF. Two of these units have been built for the Atlas, one installed in the boot of the car. All knobs have numbered scales making it easy to pre-set the antenna tuner to any band. The unit in the boot of the car is a more compact version. An SWR bridge is used to adjust the tuner which is set up for minimum SWR. With helical whips mounted on the rear bumper there is only a short length of co-ax to the tuner in the boot. The tuner should be adjusted with the boot lid closed. Thus it takes some time to arrive at correct settings for all bands.

PORTABLE 240V AC POWER SUPPLY

The Atlas portable power supply was not available at the time of purchase, so one was made from locally available parts for a considerable saving in cost.

The circuit shown in Fig. 5 is similar that in the Atlas handbook. Many other designs were considered but this one is simple to get going and can be made very compact, yet is adequate for the job of a portable AC power pack.

This supply fits into a home-made metal box 3½ inches wide, 5 inches high and 9 inches long. On the front panel are mounted the three fuse holders, two DC outlet sockets, the mains switch, and mains lead into the supply. On the rear is the heat sink holding the 2N3055.

As with the Atlas supply the high current output is not regulated. A simple regulator is used for the low current circuits up to about 1 amp.

The two outlet sockets are a 6 pin Painton for the main supply with two pins in parallel for each circuit, the other a four pin Painton providing only the regulated 13 volts for other equipment (in this case for an IC502).

One suitable transformer is the Ferguson PF3788 which has two secondary windings each of 15 volts with a tap at 12 volt. Each winding is rated at 4 amps.

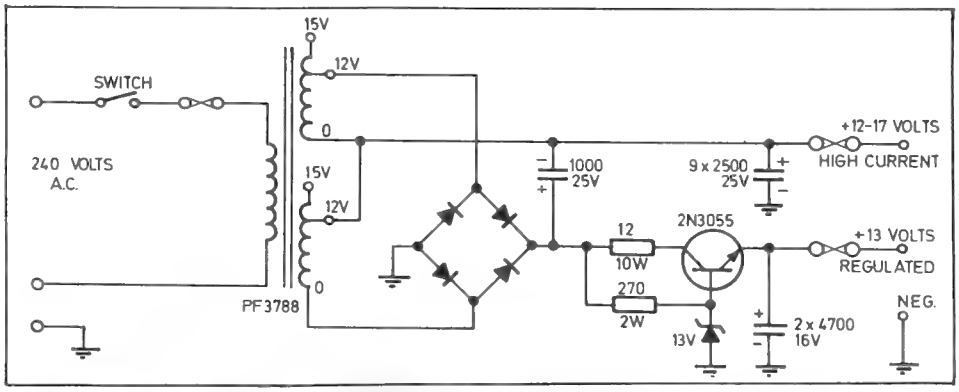
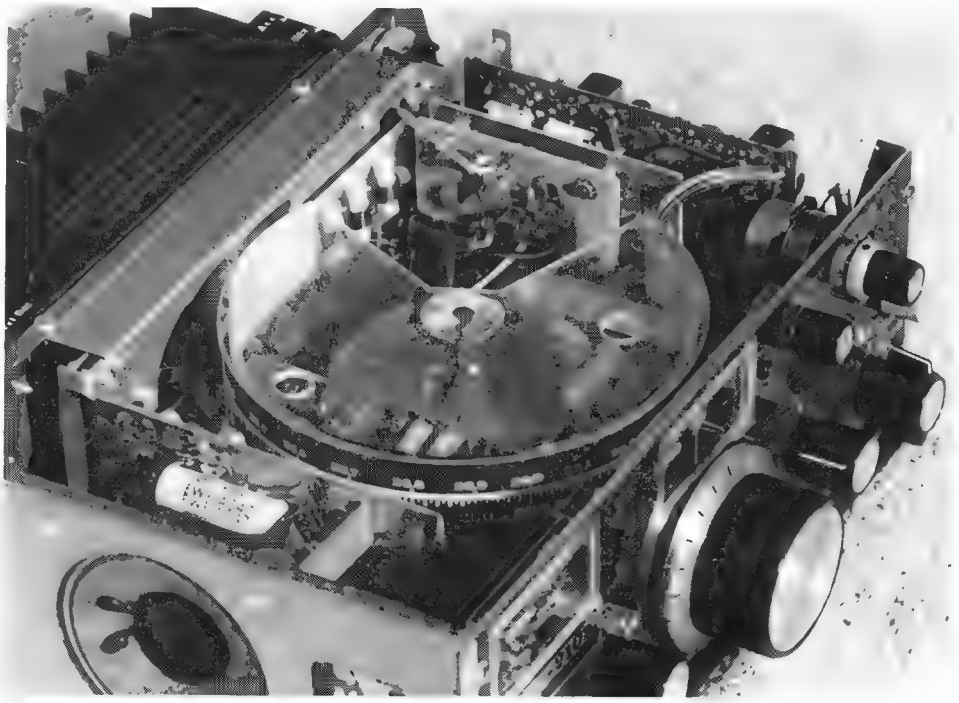


FIGURE 5: Power Supply.



View of RF Preamp installed.

The bridge rectifier is a PB40 rather than separate diodes. Nine 2500 microfarad capacitors were mounted on a plug-in Veroboard for the filter and the remaining parts were mounted on another piece of plug-in board.

The main high current circuit will supply about 10 to 12 amps at about 11 volts under CW conditions which has proved ample for portable use.

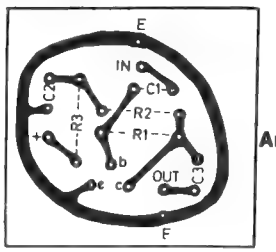
POWER SUPPLY LEADS

Several power supply leads have been made up to allow the Atlas to be used from various power supplies.

In all cases an automotive diode is connected across the plug in the reverse direction to take care of the Atlas should the connecting leads be connected to the wrong polarity. Another precaution has been to terminate all leads in a 4 pin connector and fit a suitable socket to the power supply source.

A small piece of aluminium bent into shape holds the two banana sockets and plug for connecting the Atlas.

Leads are used to operate the Atlas from a 12 volt 9 amp hour motorcycle battery. To operate the receiver section only from a small 12 volt 300 mA supply and also the main transmitter AC supply.



PCB Artwork.

PA COLLECTOR IDLING CURRENT

This is adjusted to approximately ½ amp by the trim pot R515, it is mounted on the component side of the heat sink and provided with an access hole from the rear of the heat sink underneath the transistor Q503-40582, this is mounted on the rear side of the heat sink.

A small plastic bolt 3/16 in. x ¾ in. long was filed down to fit into the slot, making a shaft for this trim pot, making adjustment more convenient as the idle current varies when changing to different supplies. ■

CHIRNSIDE ELECTRONICS

AT CHIRNSIDE WE'VE GOT IT ALL!!!!

YAESU.

FT-901DM.160-10M Transceiver.....$1499.
FT-101E. 160-10M Transceiver.....$849.
FT-301. 160-10M Transceiver.....$975.
FT-301S. 160-10M Transceiver.VOX Cal.-AM ...$725.
FT-301D. 160-10M Digital Transceiver.....$1075.
FT-7. 80-10M Transceiver.....$525.
FP-4. Matching Power Supply.....$63.
FRG-7. General Coverage Receiver.....$335.
FRG-7000. Digital General Coverage Receiver. ..$659.
FT-227R. 2m. Mobile Transceiver.....$330.
FT-225RDM. 2M. ALL Mode Transceiver..... $POA.
FR-101D. Receiver.....$85.
FR-101DD. Digital Receiver.....$1050.
FL-2100B. 1200 Watt Linear Amplifier.....$530.
FL-110. 200 Watt DC input Linear Amplifier. ....$239.
YO-100. Monitorscope for FT-101E.....$279.
YO-101. Monitorscope for FT-101E.new model..$368.
YO-301. Monitorscope for FT-301 series.....$369.
FP-301. Matching Power Supply for FT-301 series.
.....$178.
FP-301D. Digital Power Supply.....$288.
YP-150. Dummy Load-Watt Meter. .....$108.
YD-844. Desk Mic.....$45.
QTR-24. 24 hr.World Clock.....$33.
FV-101.. Matching VFO for FT-101E. .....$149.
FV-301 Matching VFO for FT-301 Series.....$159.
FC-301 Antenna Coupler Inc.SWR and PWR Meters.
.....$220.
YC-500S. 500 Mhz. Frequency Counter. .....$380.
YC-500J. 500 Mhz. Frequency Counter. .....$319.
FL-101. Transmitter.Companion unit for FR-101. $675.
FTV-650B. 6M.Transverter.....$249.
FTV-250. 2M.Transverter. .....$249.
R-301. Relay box for FT-301 to FL-2100B. .....$23.
SP-101. Matching External Speakers for FT-101E,
FR-101,FRG-7,FT-301. .....$45.
YC-601. Digital readout Adaptor for FT-101E ...$248.
YD-846. Hand mic. .....$18.50.
FT-625D. 6M.ALL Mode Transceiver. .....$TBA.
FT-225R. All Mode Transceiver.Analog Dial.....$POA.
Optional Crystal Filters.....$59.

HIDAKA.

Antennas.

VS-33. 3el.Triband Beam 20-15-10M.Inc.Balun..$255.
VS-22. 3el.Duoband Beam 15-10M Inc. Balun ...$169.
VS-41-80KR. 80-10M Trapped Vertical. .....$110.
VS-RG. Radial Kit for VS-41-KR. .....$32.
VS-20CL. 3el.W.S. 20M Beam.Inc.Balun.....$199.

HY-GAIN.

204BA. 4el. 20M Beam. .....$254.
TH6DXX, 6el. Trap Beam. .....$335.
TH3Mk3. 3el. Trap Beam. .....$299.
TH3JR. 3el.Trap beam. .....$210.
HY-QUAD. 2el.Quad Beam.....$310.
Yaesu Gutter Mount Mobile Whips.Complete set 80-10M
Inc. 2M.....$112.
Asahi AS-303. HF Mobile antenna set
INC. ball mount and spring.....$135.
AS-NK Matching SS Bumper Mount for AS-303...$20.

KENWOOD.

TS-520S. All Band Transceiver. .....$POA.
TS-820S. HF Digital Transceiver. .....$POA.
AT-200. Antenna Coupler. .....$174.

MONITOR RECEIVERS.

MR-2. Mini Monitor 12 ch. Pocket receiver VHF. $135.
MS-2 Mini Scanning Receiver 4ch.Inc. .....$185.

EMOTATOR.

Rotators still available from CHIRNSIDE ELECTRONICS

103LBX. Medium Duty. Suitable for VS-22 .....$139.
502CXX. Heavy Duty. Suitable for VS-33 .....$209.
1102MXX. Extra Heavy Duty. .....$305.
1103MXX.....$329.
1211 Mast Clamp for 103LBX.....$18.
1213 Mast Clamp for 502CXX. .....$28.
1215 Mast Clamp for 1102-3MXX. .....$45.
300 Mast Stay Bearing.....$30.
VCTF-7. 7 Core Cable.per Metre.....$1.15
VCTF-6. 6 Core Cable.per Metre.....$0.95.

ANTENNA COUPLERS.

HC-75. Tokyo Hy-Power Labs.Transmatch
75W PEP. .....$72.
HC-250. Tokyo Hy-Power Labs.Transmatch
250W PEP. .....$85.
HC-500. Tokyo Hy-Power Labs.Transmatch
500W PEP.Inc.160M.....$112.
HC-2500. Tokyo Hy-Power Labs.Transmatch
2.5Kw. PEP.....$199.
AT-200. Kenwood. 200 Watts .....$174.
KW E-Zee Match. .....$108.
FC-301. Yaesu.Inc.SWR and PWR Meters. .....$220.

MORSE KEYS.

HK-707. On standard base with dust cover
and knob.....$18.
HK-710. De Luxe heavy duty morse key.....$42.
TC-701. Practice keyer with built in Osc. .....$18.
EKM-1A. Morse Practice Osc. .....$14.

MISC.

SWR-200. Large dual meter SWR.....$70.
FS-600A. Peak Reading Wattmeter SWR Meter. ..$73.
ME-11X. Twin SWR-PWR Meter. 3.5-150Mhz. ...$18.
RS-101. Small single SWR Meter. .....$9.75.
Western 5 Pos.Coax Switch.....$35.
Diawa 2 Pos. Coax Switch.....$21.
TWS-120. 2 Pos.Slide Coax Switch.....$15.
VS-1. Mini Mic. Compressor. .....$22.50.
VS-BN. Ferrite Balun 2Kw.for Beams and Doblets..$25.
TV-42. Drake 3 Section Low Pass Filter.1.5Kw.....$25.
Multi-band dipole traps and centre insulator
80-10M.....$35.
Porcelain Egg Insulators.each .....$0.50.
Wide Range of Coax Cable and Connectors in stock.

VALVES.

6JS6C .....$10.50.
6KD6 .....$12.50.
12GB7 .....$9.50.
572B .....$52.00.
6146B .....$13.50.

Most YAESU Equipment Ex-Stock and on Display at all Times.

Pre-Sales checking is carried out on all equipment before despatch.

All equipment comes with proper English instruction manuals as supplied by factory, complete with 90 days warranty and spare parts back up.

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE

Insurance 50 c per $100. Please add sufficient for freight or postage, excess will be refunded.

CHIRNSIDE ELECTRONICS
26 EDWARDS RD.
LILYDALE 3140.
PHONE (03)726 7353

CHIRNSIDE ELECTRONICS

APPOINTED YAESU AND HIDAKA DISTRIBUTORS.
DIRECTOR: FRED SWART – VK3NBI

YAESU FT-7

NOW REDUCED TO ONLY
$525.

RECEIVER

Sensitivity:	0.3 μV for S/N 10 dB or better
Image Rejection:	Better than 50 dB
IF Rejection:	Better than 50 dB
Selectivity:	–6 dB: 2.4 kHz, –60 dB: 4.0 kHz
Audio Output:	3 Watts @ 10% THD

YD-148
Desk Mic.
$45.

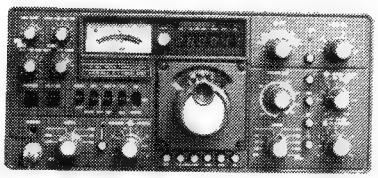
SPECIFICATIONS

GENERAL

Frequency Coverage:	80 m 3.5 - 4.0 MHz, 40 m 7.0 - 7.5 MHz, 20 m 14.0 - 14.5 MHz, 15 m 21.0 - 21.5 MHz, 10 m 28.5 - 29.0 MHz installed, any 500 kHz segment between 28.0 and 29.7 MHz available
Power Consumption:	13.5 VDC – 3 A transmit, 0.4 A receive.
Dimensions:	230(W) x 80(H) x 290(D) mm.
Weight:	Approx. 5 kg.

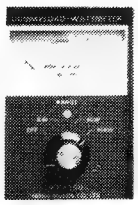
TRANSMITTER

Emission:	LSB, USB, CW
Input Power:	20 Watts DC
Carrier Suppression:	Better than 50 dB below rated output
Unwanted Sideband Suppression:	Better than 50 dB @ 1000 Hz
Spurious Emission:	Better than 40 dB
Distortion Products:	Better than 31 dB
Transmitter Frequency Response:	350 - 2700 Hz –6 dB
Frequency Stability:	Less than 300 Hz drift from a cold start; less than 100 Hz over a 30 minute period after warmup.



FT-901DM 160-10M
$1499.

YP-150

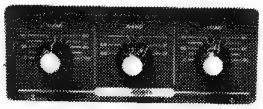


$108.

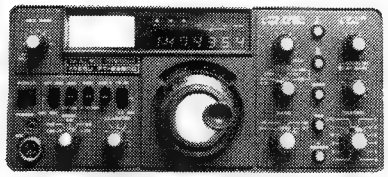
Dummy Load/Power Meter

Frequency Range: 1.8MHz – 200MHz
Impedance: 50 ohm unbalanced.
Power Scale: 0–6 watts, 0–30 watts, 0–150 watts.
VSWR: Less than 1.2 at 145MHz.
Maximum Error: Within 10% of maximum scale.
Size: 104(W) x 153(H) x 280(D) m/m.
Weight: 2 kg.

HC-500A **$112.**



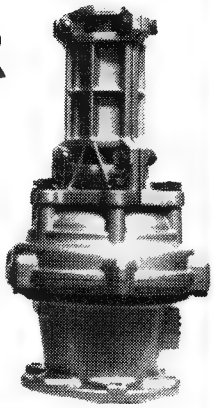
Antenna Coupler.
Extremely important, especially with modern all-solid state transceivers, is the maintenance of a very low SWR to avoid destruction of costly high-power P.A. transistors. An antenna coupler enables precise adjustment with almost any antenna.

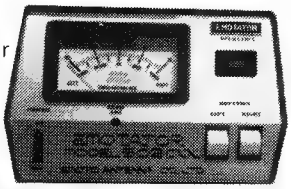


Yaesu FT-225R.Digital 2M.

Morse Keys.
$18.

EMOTATOR Rotators





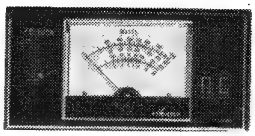
103LBX Medium duty Rotator
502CXX Heavy duty Rotator
1102MXX Extra Heavy Duty Rotator
1215 Mast clamp for 1102MXX
1211 Mast clamp for 103LBX
1213 Mast clamp for 502CXX
300 Mast Bearing

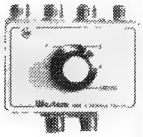
COUNTER-GENERATOR
$208

QTR-24
$32.

FT-227R FULLY SYNTHESIZED 2M FM TRANSCEIVER
$335.

SWR-200 Large dual meter.
Full 2KW rating. Individually calibrated to show power O/P. **$70.**





FS-600A **$73.**
Peak Reading Wattmeter SWR meter.

MOST EQUIPMENT IN STOCK AND ON DISPLAY.

CHIRNSIDE ELECTRONICS. 26 Edwards Road, Lilydale, 3140. Phone: (03) 726 7353.

SIDEBAND ELECTRONICS IMPORTS, P.O. BOX 23 SPRINGWOOD, N.S.W. 2777, WAREHOUSE 76 CHAPMAN RDE. FAULCONBRIDGE
TELEPHONE (047) 51-1394 After Hours (047) 54-1392

My $50,000.- order of HY-GAIN antennas, the first ocean-freight shipment to leave the factory since the new management re-activated the plant, should have arrived by now. Meanwhile, while it was still in doubt whether anyone would take over, I have managed to construct a satisfactory Chinaman's copy of the 204-BA entirely from locally available materials. I have also a design for a practical 40 Meter Yagi. Anybody interested can ask for details how to make a 204-BA for $125.-

This offer includes a Xerox copy of the 204-BA manual at cost for one dollar postpaid, copies of manuals of all other Hy-Gain antennas can also be made, may cost a dollar or so more for the 16 page ones.

As a further public service, copies of KENWOOD service bulletins can be supplied for a dollar each for the alignments etc. of the TS-520, TS-520/520S, TR-7400A, TS-700A and TS-520/620 30W power reduction conversions. KEEP MY XEROX MACHINE BUSY!

A few more specials, No. 14 hard drawn copper antenna wire, new, 10¢ per Meter; one inch diam. foam insulation 50 Ohm coax cable, ideal for low-loss 430 MHz, $3.- per Meter, but collect only, it cannot be rolled in less than 1.5 Meter diameter!

HY-GAIN ANTENNAS:

18-AVT/WB 10-80M vertical 23' tall	$125.-
TH6-DXX 10-15-20M senior 6 el.Yagi 24' boom	$300.-
TH3-MK3 10-15-20M senior 3 el.Yagi 14' boom	$240.-
TH3-JR 10-15-20M junior 3 el.Yagi 12' boom	$175.-
204-BA 20M 4 el. Tiger Yagi 26' boom	$190.-
HY-QUAD 10-15-20M full size Cubical Quad	$260.-
11M 5 el.Yagi, reduce size slightly for 10M	$70.-
2M 5 el.Yagi with balun 7'3" boom	$25.-
2M 8 el.Yagi with balun 12'6" boom	$30.-
BN-86 balun, for beam buyers	$20.-

KENWOOD PRODUCTS:

TS-520S 10-160M SSB/CW transceiver 240V AC	$675.-
TS-620S 10-160M SSB/CW w/digital readout	$1,050.-
DG-5 Digital display for the TS-520S	$175.-
TV-506 6M transverter	$200.-
TV-502 2M transverter	$235.-
AT-200 Antenna matchbox	$165.-
DS-1A DC-DC converter	$70.-
DK-520 adaptor for DG-5 to TS-520 use	$25.-
TS-700SP 2M all-mode transceiver	$750.-
LF-30A low pass anti-TVI filter	$30.-

All other KENWOOD accessories shortly available.

YAESU MUSEN PRODUCTS:

FT-101E 10-160M AC/DC w/Speech processor	POA
FT-901D Deluxe AC/DC 10-160M Digital transceiver	POA
FT-7 Mobile 10-80M 20W 12V DC transceiver	POA
FL-2100B 10-80M 1200W Linear Amplifier	POA
FRG-7 .5-30 MHz General coverage receiver	POA

SPECIALS FOR NOVICE LICENSEES:

Transceivers for 10M coverage, AM/USB, 15W PEP	
SIDEBAND SE-502 240V AC/12V DC 23 channels 28.300-28.600 MHz, SWR/RF meter	$150.-
UNIVERSE 224M 12V DC 24 ch. 28.480-28.595 MHz in 5KHz steps Clarifier operates on receive & transmit giving virtually continuous crystal controlled operation	$125.-
ATLAS 210X 10-80M Mobile trans. w/HD cable	$825.-
FOR MULTI QUARTZ-16 24 ch. 10W 12V DC 2M trans. w/xtals for repeaters 1-8 and ch. 40 & 50	$175.-
ICOM IC-202 2M SSB portable transceiver	$175.-
ASTRO 200 modified for latest circuitry including SWR/mismatch overload control	$750.-

COAX CONNECTORS:

PL-259's - all types - in-line splices - each	75¢
SO-239 2 hole or single hole w/lock nut each	75¢
Double male connectors	85¢
3- & 4-pin mic sockets, 3- & 4-pin in-line plugs	85¢
3 circuit microphone jack	85¢
2'6" coloured leads w/crocodile clips - 5 for	$3.-

ACCESSORIES:

Ferris SWR/Field Strength meter	$15.-
SWR-50A 3.5-150MHz 1KW Twin SWR/Power meter	$22.-
Bumper mounts with 3/8" 24 thread ant. mount	$7.00
Gutter mounts with 3/8" 24 thread ant. mount	$4.50
5 metre lengths RG-58U w/PL-259 one end	$3.-
M-ring body mount	$3.-
GLP right angle RG-58U to SO-239 w/lock nut & weatherproof cap	$3.50
MLS right angle RG-58U to PL-259	.90¢

ROTATORS:

KEN KR-400 Azimuth rotator w/28V AC control box	$100.-
KEN KR-500 Elevation rotator w/28V AC control box	$125.-

All prices quoted are net, ex Springwood NSW, cash with order, subject to change without prior notice. Be aware that the value of our dollar is going down all the time, except in exchange to the American dollar. Imports from Japan will continue to become dearer all the time, from 1/4/78 to 1/6/78 already close to 10%.
All risk insurance is free, freight by air, road, rail or post at cost, Comet/collect preferred. All orders cleared on a 24 hours basis after receipt with payment.

Arie Bles (VK2AVA) Proprietor
Roy Lopez (VK2BKL) Manager

MODIFYING CB TRANSCEIVERS ONTO THE NEW 23-CHANNEL SYSTEM ON 10 METRES FOR ONLY $24.00

Sam Voron VK2BVS
2 Griffith Avenue, East Roseville 2069

With the national adoption of a 23-channel system on the 10 metre band and the allocation of 28.1 to 28.6 MHz for novice amateur use, and with the cost of 23-channel AM transceivers dropping to $40 and 23-channel SSB sets reaching $130, many of our newly licensed amateurs are getting into amateur radio by modifying such inexpensive 11 metre gear onto 10 metres.

The versatility of many of these modified CB transceivers has contributed to the growing local usage of 10 metres in the areas of mobile, base, pedestrian hand-held and backpack radio operation on 28 MHz. This article describes how to modify a 23-channel Hygain V from 27 MHz to 28 MHz. This transceiver uses a circuit which is identical to the Midland 13-892, the Kraco 2355, the Kraco or Universe 2340, the Sideband Electronics SE502 and SE501. Just with 12 watts PEP and a ¼ wave ground plane antenna contacts with an amateur in New York city and another in West Berlin were made soon after modifying the transceiver onto 28 MHz.

Operating the unit in a shoulder carrying bag which also contained a small 5½ ampere hour sealed battery and a 4½ foot helical antenna, the author has had hours of fun, walking around the streets of Sydney, working the 10 metre DX around Australia, waving to the passing CBers and saying hello to a few police officers. Help publicize amateur radio by operating out in the community. This article will help you get a portable HF DX station going.

As from the 1st January 1978 only 18-channel CB transceivers are licenceable for the citizens radio service. 23-channel unit licences can be renewed if they were licensed prior to that date and are in the possession of the original licence. As a result, a large number of 23-channel transceivers which are excellent for modification onto 10 metres, are available very cheaply in the "Wanted to Sell" section of the daily newspapers and in CB magazines.

CB transceivers employ three types of frequency generation. (1) The old method of two crystals per channel (one for receiving and one for transmitting). (2) The recently popular method of frequency synthesising, for which much information currently exists for modifying such units onto 10 metres. (3) The increasingly popular phase-locked loop (PLL) system which offers exciting possibilities for 10 metre modification but for which currently I have not been able to obtain any details on modification of such systems onto 10m.

27 MHz transceivers using the frequency synthesised method of frequency generation can be modified onto the 23-channel system on 10 metres by locating the 10 synthesising crystals which are found in a bank of 4 and a bank of 6 crystals. A pair of crystals, one from each bank, is selected by the channel switch. This method allows generation of all 23 channels. Only one of these banks of 4 or 6 crystals need to be changed to modify such CB units onto 10 metres.

MODIFYING THE HYGAIN V ONTO 10 METRES

In the case of the Hygain V transceiver, the bank of 4 crystals in the 14 MHz range each have a series trimmer capacitor which would need to be readjusted if this bank were to be changed. It is therefore simpler to change the bank of six 23 MHz crystals. When changing the crystals in either bank for 10 metre use, this is easily calculated by adding 1.335 MHz to the existing crystal frequencies. This is obtained from the formula: Channel 1 on 10 metres (28.3 MHz) minus Channel 1 on 11 metres (26.965 MHz). The six new crystals required to cover the 23-channel 10 metre range for the Hygain V and similar transceivers are 24.665 MHz, 24.715 MHz, 24.765 MHz, 24.815 MHz, 24.865 MHz and 24.915 MHz.

All six crystals can be obtained for a total outlay of $24 (U.S.), ($4 per crystal, postage included) from Jan Crystals, 2400 Crystal Drive, Fort Myers, Florida, U.S.A. 33901. Simply state the make and model number of your transceiver and crystals will be made to the manufacturers own specifications, list the six crystals you require and specify these as "CB synthesised crystals" to obtain this special price. Delivery is by airmail within 3 weeks. Customs duty and sales tax may be payable in addition.

Remove the old 6 crystals and note which crystal went in which socket, then solder in the 6 new crystals.

TUNING THE RECEIVER FROM 11 TO 10 METRES FOR AM AND USB OPERATION

1. Set the signal generator onto channel 13 (28.450 MHz).
2. With the switch on USB and a heterodyne note beating with the signal generator tune —

L18 the front end input RF amplifier coil
L19 the input coil to the mixer
L20 the mixer output coil
L202 the 38 MHz amplifier input coil
L203,
L204 the 38 MHz amplifier output coils.

Tune all coils for maximum S meter readings.

3. Check that each channel is operative, if the highest channel is not oscillating or if two channels are receiving a common frequency (an interesting overtone problem) then the solution in both cases is to slightly turn L201, the main 24 MHz overtone oscillator output coil.

Both USB and AM receive should be fully operative on 10 metres. The S meter circuit appears to be frequency sensitive and reads lower on 28 MHz even though the receiver does not lack any sensitivity. Adjust the trimpot RV9 for reasonable relative S meter readings.

TUNING THE RECEIVER FROM 11 TO 10 METRES FOR LSB OPERATION

1. Set the signal generator onto channel 13 (28.450 MHz).
2. With the switch on LSB and a heterodyne note beating with the signal generator tune —

L15 the 16 MHz amplifier input coil.
L16,
L17 the 16 MHz amplifier output coils.

Tune all coils for maximum S meter readings.

THE 23 CHANNEL SYSTEM ON 10 METRES

Channel Number	MHz	Channel Number	MHz
1	28.300	13	28.450
2	28.310	14	28.460
3	28.320	15	28.470
4	28.340	16	28.490
5	28.350	17	28.500
6	28.360	18	28.510
7	28.370	19	28.520
8	28.390	20	28.540
9	28.400	21	28.550
10	28.410	22	28.560
11	28.420	22A	28.570
12	28.440	23	28.590

TUNING THE TRANSMITTER FROM 11 ONTO 10 METRES FOR USB AND AM OPERATION

1. Feed in the random noise from a 2 metre FM receiver or a constant tone through the microphone of the Hygain V.
2. Set the switch to USB and channel selector to 13 (28.450 MHz) and tune:

L2 the output from the 27 MHz mixer
L3 the input from the 27 MHz preamplifier
L4 the input to the driver
L5 the input to the RF power amplifier
L6,
L7 the output from the RF power amplifier.

Tune all coils for maximum power output into a dummy load.

Both USB and AM transmit should be fully operative on 10 metres. Alignment is best carried out on USB rather than AM to achieve the 12 watt PEP level on SSB. Trimpot RV8, the SSB microphone gain control, can be adjusted fully if desired. On AM trimpot RV7, the AM microphone gain control, can be somewhat increased with the effect of improving the AM transmit audio quality.

TRANSMIT LSB OPERATION

This should be fully operative on 10 metres, if not, then using the same procedure as above, tune L15, L16 and L17 for maximum power output on LSB.

MODIFYING CB UNITS ONTO 10 METRES

As well as being frequency synthesised systems, check that coils are easy to tune before specially obtaining a CB unit for modification. The Hygain V and similar units are very easy to tune, as all coils are freely adjustable.

A GUIDE TO MODIFYING SOME OF THE 23-CHANNEL FREQUENCY SYNTHESISED TRANSCEIVERS FOR OPERATION ON THE 10 METRE BAND

Compiled with the help of VK2BK, VK2BZJ, VK2NDS, VK2NDX, VK2NEV, VK2NEJ, VK3AIH and VK4NBL.

AM ONLY

Units employing the frequency synthesised generation method:
Seiki, Midland, Realistic, Panther, Cobra, Fairmate. Existing crystals: 37.6, 37.65, 37.7, 37.75, 37.8, 37.85 MHz.

AM AND SSB

Units employing the frequency synthesised generation method:

(674B) Hygain V, Hy Range V, SE502, Kraco 2340, 2355, Midland 13-892, SE501 (these units have proved especially popular on 10 metres). Existing crystals: 23.330, 23.380, 23.430, 23.480, 23.530, 23.580 MHz. Zodiac Torus, Panther-Pearce Simpson. Existing crystals: 11.805, 11.855, 11.955, 12.002, 12.055 MHz.

Midland 13-893 and 13-895. Existing crystals: 11.0035, 11.0135, 11.0235, 11.0435 MHz.

Tram XL5 and Belcom S-8655. Existing crystals: 7.4625, 7.4725, 7.4825, 7.5025 MHz.

UT122E, Gemtronics 2325 and 3325, Scooper 9000. Existing crystals: 11.000, 11.050, 11.100, 11.150, 11.200, 11.250 MHz.

The new crystals for these popular units are obtainable by adding 1.335 MHz to the existing crystals. The outline on how to modify the Hygain V should be a guide to modifying some of the above units. The above guide comprises only a small number of the frequency synthesised units which may be modified for 10 metres, following the basic ideas outlined.

ADDING AN ADDITIONAL CHANNEL

Most 23-channel selector switches are able to provide an additional channel on a blank position, usually between channels 22 and 23. When connected, the channel is known as channel 22A — 28.570 MHz. With three additional connections, this can easily be obtained on the Hygain V and similar units. VK3NAU shows how this can be done on his Midland 13-892 in fig. 1.

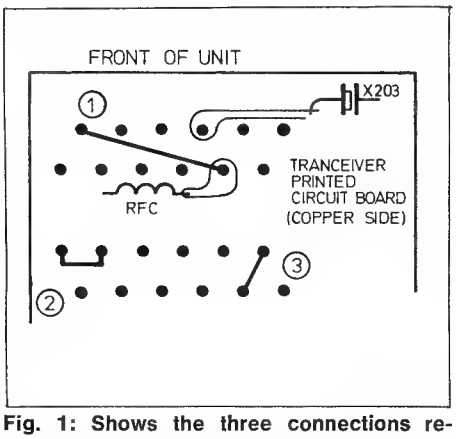


Fig. 1: Shows the three connections required between and within the six rows of crystal terminals on the copper side of the printed circuit board.

OPERATING ON 10 METRES

28.500 MHz is a popular listening channel in Sydney, Melbourne and Adelaide, with 28.550 MHz being monitored in Brisbane. Both these frequencies carry WIA broadcasts in various states. In Sydney 28.5 MHz is being used as an all mode calling channel. Contacts are established on USB, CW or AM and usually change to a lower channel to continue the contact. Worldwide DX communications is normally carried out in the channels from 28.5 to 28.590 MHz.

OPERATING HAND-HELD OR BACK PACK PEDESTRIAN

Many of the 1 watt and 5 watt hand-held AM units are easily modified onto 10 metres. Some hand-held units are frequency synthesised and can thus cover all 23 channels (e.g. Realistic TC101 5 watt, 23-channel, hand-held) other units use the two crystals per channel system and can be fitted with 28.3, 28.4 and 28.5 MHz crystals which are available. Using such a hand-held on 11m AM when that band was available, I was able to contact a station in Perth just by calling CQ. Such 2000 mile contacts on low power AM will often be easy to experience on 10 metres during summer and mid-winter sporadic E periods. Operating the Hygain V as an over the shoulder hand-held or as a back pack pedestrian, portable can be achieved by obtaining a 5½ ampere hour motor bike battery. These are light weight, only cost $14, and will supply power for a long period before recharging is necessary. A visit to a camping or disposals store should locate for you a small carrying pack to hold the rig, battery and an 11m helical which can be shortened for use on 10m. 5 foot helicals can be shortened to 4½ feet and mounted as high up in the carrying pack as possible. Some 7 feet of wire can be used as the ground plane. Connect one end to the earth connection on the helical antenna mount and make one loop around your tummy. Twist this loop some 6 times and tighten the loop around your waist. Let excess wire hang down by your side. To experiment with the SWR, change the position of the helical in the carrying pack and vary the number of twists on the loop. An SWR of under 1.5 to 1 should be obtainable after a bit of experimenting. Carry an SWR meter in the pack so that SWR can be monitored occasionally whilst operating. Using this kind of set up whilst walking up to my local hamburger shop with my 10 metre portable, I have been able to have some very good contacts into Tasmania, Queensland and South Australia. My aim is to work all Australian States while walking pedestrian hand-held back pack both on SSB and AM.

VFO FOR 10 METRES

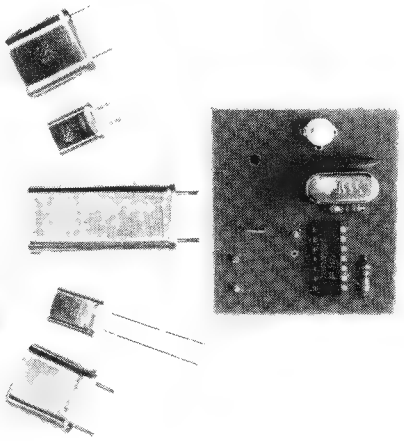
Modified CB transceivers offer an opportunity for a whole range of experimentation in modifications and additions. VK3AIH has been successful in designing a VFO for the units similar to the Hygain V which he hopes to describe in AR soon. Work is also progressing on a 160 metre transverter which can take advantage of the portable and mobile nature of modified CB equipment. ■

TO COMPLEMENT OUR USUAL RANGE OF CRYSTALS

BRIGHT STAR CRYSTALS PTY. LTD.

35 EILEEN ROAD, CLAYTON, VIC., 3168. Phone: 546-5076 (Area Code 03)

CAN SUPPLY A RANGE OF —



- OSCILLATORS
- WIDE-BAND AMPLIFIERS
- TTL & CMOS DECADE COUNTERS
- ELECTRONIC CRYSTAL OVENS

INTERSTATE AGENTS:

Adelaide: ROGERS ELECTRONICS — Phone 42 6666
Brisbane: FRED HOE & SONS PTY LTD — Phone 47 4311
Perth: COMMUNICATION SYSTEMS — Phone 76 2566
Hobart: DILMOND INSTRUMENTS — Phone 47 9077

All Mail to be addressed to: P.O. BOX 42, SPRINGVALE, 3171

AMATEURS' PARADISE

BUY FROM QUEENSLAND'S STOCKIST

SEE OUR RANGE OF **KENWOOD GEAR** — TS520S, TS820S, DG5 Digital Readouts, DC Convertors, VFOs, Speakers. WHY WAIT? ALL IN STOCK.

VICOM AGENT for the GOLD COAST — check our ICOM equipment in stock.

SOLE DISTRIBUTORS for QLD. of the new **BEN LINEAR AMPLIFIERS** — Models for all bands — 70-120 watts — all the one price, **$159** — a beautiful unit.

Also ROTATORS, VHF and UHF Beams, all band VERTICALS, BALUNS, FT7s, FRG7s, FT101E MORSE KEYS, WORLD MAPS, ZL CALL BOOKS, MIKES, CLOCKS, LP FILTERS, SWR METERS, etc.

121 NERANG STREET, SOUTHPORT, QUEENSLAND 4215
(Opp. Southport Hospital) **Telephone: (075) 32 2644**

Visiting Hong Kong

LET US ASSIST

WRITE FOR INFORMATION

ALL BRANDS

HF

VHF

UHF

RECEIVERS

ACCESSORIES

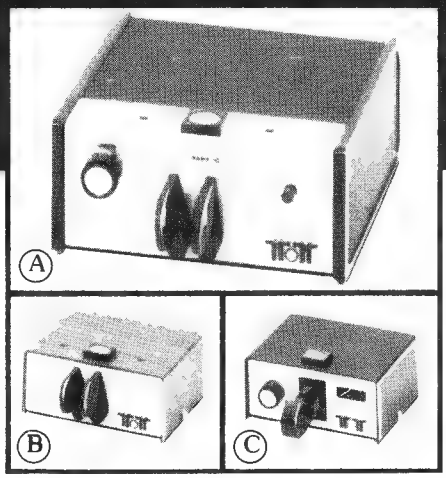
Tel. K 36 0606 K 38 3774

DELTA COMMUNICATION SERVICES LTD.

15 CUMBERLAND ROAD, KOWLOON-TONG, KOWLOON HONG KONG

Perfect CW is Automatic with TEN-TEC

ULTRAMATIC KEYERS



(A) TEN-TEC KR50 Deluxe Dual-Memory, Dual-Paddle Keyer $135.00

Here's the completely automatic electronic keyer **you** control. Fully adjustable to your own operating style and preference for speed, touch and weighting (ratio of length of dits and dahs to space between them). Dual memories individually defeatable, for operation as full iambic (squeeze) keyer, or with single memory, or as conventional keyer. Self-completing characters. User-adjusted fixed or automatic weighting (50-150%) controlled by speed setting. Adjustable paddle force (5-50 gms). Adjustable speed (6-50 wpm). 500 Hz side-tone oscillator. Built-in "straight key" button. Operates on 240VAC, 50-60 Hz or 6-14 VDC.

(B) TEN-TEC KR1-A Deluxe Dual Paddle $45.00

Same paddle as KR50, for iambic or conventional keyers.

(C) TEN-TEC KR5-A Electronic Single-Paddle Keyer $49.00

Factory adjusted actuation force for smooth keying; factory set weighting factor for smoothness and articulation. Self-completing characters. Adjustable speed (6-50 wpm). less side tone and power supply. Operates on 6-14 VDC.

For Further Information on the Full Range of Ten-Tec Equipment, Please Phone, Write or Call

Authorised Australian Distributor for TEN-TEC

graham e. stallard

27 WHITE AVE., LOCKLEYS 5032

SOUTH AUSTRALIA – PHONE 43 7981

10.7 MHz CRYSTAL FILTERS FOR FM

SYNONYMOUS FOR QUALITY AND ADVANCED TECHNOLOGY

KVG

MATCHING CRYSTAL DISCRIMINATORS

NBFM	XD107-01
WBFM	XD107 02
(1-9)	$22.10 each

Oscillator Crystals 50 kHz through 150 MHz available to order. Parallel resonant (30 pF) to 20 MHz, series resonant above 20 MHz. Write for quotation to your requirements (include mechanical size & frequency).

EXPORT ENQUIRIES WELCOME

Filter Type	XF107 A	XF107-B	XF107 C	XF107 D	XF107 E	XF107 SO4
Application	NBFM	NBFM	WBFM	WBFM	WBFM	NBFM
Number of Filter Crystals	8	8	8	8	8	4
Bandwidth	12 0 kHz	15 0 kHz	30 0 kHz	36 0 kHz	40 0 kHz	14 0 kHz
Pass Band Ripple	⩽ 2 dB					⩽ 1 dB
Insertion Loss	⩽ 3 5 dB	⩽ 3 5 dB	⩽ 4 5 dB	⩽ 4 5 dB	⩽ 4 5 dB	⩽ 3 dB
Input-Output Termination Z_t	820 Ω	910 Ω	2000 Ω	2700 Ω	3000 Ω	910 Ω
C_t	25 pF	25 pF	25 pF	25 pF	25 pF	35 pF
Shape Factor	(70 dB) 2 4	(70 dB) 2 3	(70 dB) 2 2	(70 dB) 1 9	(70 dB) 2 0	(40 dB) 3 0
	(90 dB) 2 8	(90 dB) 2 9	(90 dB) 2 7	(90 dB) 2 5	(90 dB) 2 5	
Ultimate Attenuation	> 90 dB					> 60 dB
Size	1 27/64" x 1 3/64" x 3/4" High Mounting Hardware Included					Hc 6/u can
Price (1-9)	$40.60					$18.95

SPECTRUM INTERNATIONAL INC.
Box 1084A Concord
Massachusetts 01742 USA

Shipping weights: Filters 2 oz. ea., Crystals ½ oz. ea. Registration Fee: $2.00; Air Mail: 31c per ½ oz. All Prices in U.S. Dollars.

QSP

CB TALK

The loop at the bottom of a CB antenna makes it a "Ringo".

SWR is important for CB but doesn't matter for FM.

UHF sets are no good mobile but have fantastic quality of speech on long contacts.

UHF is good and clear and will be good when the DX comes in.

From "The Lyrebird", No. 3 issue.

10m BEACON

Worldradio May 1978 includes a short article about a CW beacon on 28.888 MHz in North Hollywood, USA. Reception reports are requested to W6IRT, 7713 Wilkinson Avenue, North Hollywood, CA 91605, USA, as the licence for the beacon runs through to about November.

IARU R2 CONFERENCE

The IARU R2 triennial conference will be held in Panama from 3rd to 8th September, 1978. IARU R2 comprises the Americas, Hawaiian and near Islands and the Caribbean area. An invitation to attend the conference was extended to the Secretary-General of the ITU and he hopes to attend.

USA ISLANDS — PREFIX CHANGES

From 24th March, 1978, according to Ham Radio May 1978 the amateur call sign structure in the USA has been overhauled (amateurs moving from one call sign area in the US can retain their old call sign prefix) and this includes new prefixes as follows — KH1 Canton, KH2 Guam, KH3 Johnston, KH4 Midway, KH5K Kingman, KH5 Palmyra, KH6 Hawaii, KH7 Kure, KH8 Samao, KH9 Wake, KP1 Navassa, KP2 Virgin Islands, KP3 Serrana Bank, KP4 Puerto Rico. ■

DELAYED BRAKING ACTION FOR ROTATORS

Geoff Wilson VK3AMK
7 Norman Ave., Frankston 3199

In AR, May 1977, p. 18, in the "Commercial Kinks" section there was a very interesting circuit from P29KE showing how to modify the control unit of the Ham II rotator to delay application of the brake until the motor (and of course, the antenna) had stopped turning. As there was very little detail given at the time and this seems to be a very important subject, the following expands on the original article.

The Ham II control unit does not have separate brake and left turn/right turn controls but as supplied it is still very easy to operate these out of sequence when stopping the rotator and as a result damage can occur to either the rotator, tower or both. Most manuals supplied with large beams and rotators go to great lengths to stress the need to take precautions when a large beam is suddenly stopped. Although the speed of rotation may only be about one r.p.m., the momentum is quite large and for this reason it is desirable to let the motor slow right down before releasing the brake solenoid. The P29KE circuit does this by using a capacitor and relay with a time constant of about two seconds connected across the brake release switch. The capacitor is charged via diodes from the clockwise and counter clockwise control switches and discharges through the relay coil. When the relay coil discharges the capacitor, the relay contacts open and the brake is applied.

Having used a number of rotators with very long antennas the worth of the modifications was immediately apparent. After trying the circuit several points arose: (a) There is an error in the circuit as given, pin 1 as shown is actually pin 6, pin 1 is connected to earth; (b) Relays other than the type quoted may be used as long as the capacitor is altered in value to give a time constant of about one and a half to two seconds. I used a 7.6k ohm type with 100 uF across it but any combination that works will do, e.g. a 12 volt type may be used with series resistor etc.; (c) There was no provision for over-riding the delay circuit. This arises when turning the antenna into a strong wind and no delay is required as the antenna may then even be forced backwards by the wind. This was overcome by using a normally closed push button switch in the relay circuit. When an undeveloped stop is required the button is pressed; (d) Visual indication of brake release. Another minor modification, but well worth the effort, a LED, resistor and diode wired across pins 1 and 2 shows when power is applied to the brake release and the antenna is free to rotate. For these modifications refer to Figure 1.

Having tackled the Ham II control unit, I then tried similar techniques on another popular rotator, the Emotator Model 1100M. This was the earlier version, not the current series now being sold here. The existing circuit (as with the Ham II) was left intact and the circuit shown in Figure 2 added to produce the same effects as with the Ham II.

The only external changes to the control units were the addition in each case of a LED with mounting clip and a miniature push button switch. These were mounted as follows: Ham II — directly above each other over the words "Brake Release" on the front panel; Emotator — switch between "Left" switch and "On/Off" switch, LED between "On/Off" switch and "Right" switch. In each case sufficient space is available within the control unit for the additional components to be placed without crowding. The 56 ohm resistor shown in Figure 2 is essential, without this the "Left" and "Right" indicator lamps will flash brightly with switching surges and may even burn out. Note also the secondary voltages of the two transformers involved are 30 volts in the Ham II and 100 volts in the Emotator. Before cutting any holes in the panels firstly remove carefully the meter from each control unit and protect the transformers from flying steel chips which will result from any drilling. ■

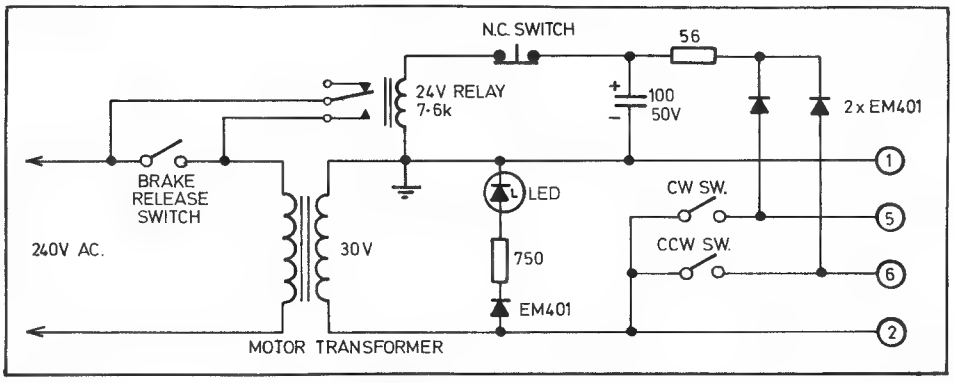


FIGURE 1: Ham II Circuit.

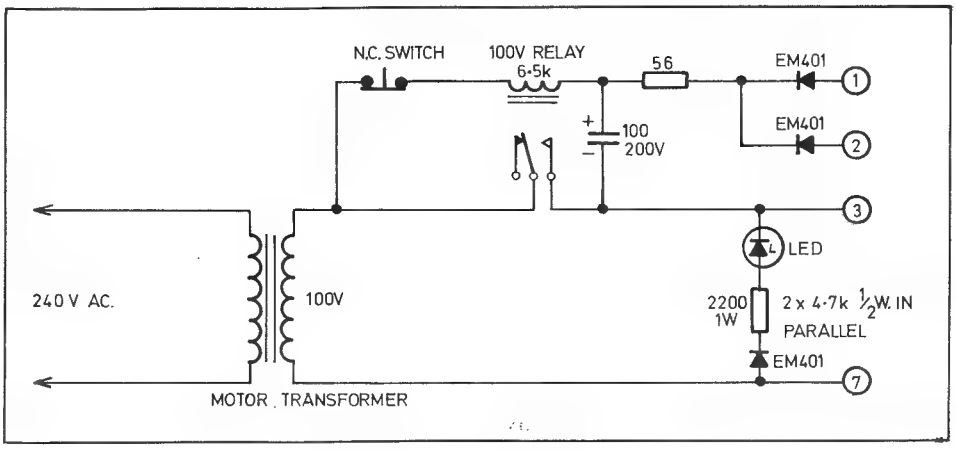


FIGURE 2: Emotator Circuit.

VIDEO GUNNPLEXER SYSTEM

Bob Cooper W5KHT

The fascination of amateur microwave application is unique. First of all, microwave systems have an exotic ring to them. Until the appearance of the Gunnplexer, getting into microwaves required either a six foot rack of surplus gear or a friend on the inside of a microwave hardware supply company. The Gunnplexer has changed all of that; you can hold the whole blamed thing in the palm of your hand and you don't need any friends in the microwave business. In fact it may be better if you don't have any prior microwave knowledge because the Gunnplexer pretty much throws away the book on standard microwave design practices!

An equal fascination is the wide band capability of the microwave region. The 10 GHz assignment, for example, has spectrum-space for 111 *simultaneous* video (4.5 MHz wide) channels. Try that even using SSTV in the 20 metre assignment.

Another fascination is the "security" of the spectrum. It is not likely that people will "stumble across" your signal at 10,250 MHz and that means you can do things there (legally of course!) which you would be ill-advised to attempt even at 440 MHz.

A fourth fascination is the challenge. For example, the Gunnplexer accessory horn antenna has a nominal gain of 17 dB. Unbolt the horn and replace it with a 2 foot surplus dish and you have just added another 16 dB of gain to your system. Put a two foot dish on *both* ends of the circuit and you have just added 32 dB of gain to the "system circuit". Do you know what 32 dB is? Run the 1 kW output of your rig down to 1.0 watt output. That's 30 dB.

Another way to look at the Gunnplexer system is to note that the nominal 20 milliwatt output power is around 17 dB below 1 watt. If the horn antenna has 17 dB of gain, the Gunnplexer has the rough equivalent of 1 watt into a 0 dB gain antenna. With that much established, if you run your 1 watt equivalent power into an antenna that has 16 dB of gain (a two foot dish at 10 GHz has "horn gain *plus* 16 dB" or approximately 32 dB), what you really have is the equivalent of your one watt two metre hand-held loading a 16 dB gain antenna. Not a bad system. It will certainly "talk" several miles, reliably.

The bottom line on microwave is simply that it will do much more communicating than you might first suspect; it is so wide band that you can shove video or data or lots of voice through it simultaneously, and thanks to the Gunnplexer, you can hold it in the palm of your hand.

Although I operate on 439.25 MHz with ATV system and therefore am not new to a reasonably state-of-the-art fast scan ATV, the thrill of ATV at 10 GHz is almost undescribable. First of all, with the system described here there is the "FM advantage"; which means that you have the extra system gain that FM modulation adds.

Next there are the really rock solid and noise free signals. With FM, while it is possible to have signals with some hint of noise (or snow in video) on them, between the point where there is sufficient signal voltage to drive the system into limiting, and the point where you have no signal at all, there is typically a fairly narrow "dB" range. In the real world you typically have lots of signal or no signal at all.

THE MARK II SYSTEM

The system described here is a Mark II version of the first attempt at getting video through the Gunnplexers. The first system proved it could be done, for very little cost, but the range left a great deal to be desired.

To get good range you need a high gain, low noise IF and considerable stability. The first W5KHT package selected a rather high IF of approximately 260 MHz where a pair of 180-degree-out-of-phase coaxial lines (¼ wave and ¾ wave) were utilized for the discriminator. The system worked but suffered from a very high noise figure; created by a CATV type hybrid chip amp selected for the IF amplifier. So back to the drawing boards.

The system shown here uses a 41.25-45.75 MHz IF. The reasons are simple enough; this is in the TV receiver IF range and circuits as well as relatively low cost components are readily available. Plus, by selecting an IF in this relatively low VHF range it is possible, using the J310 FET, to realise IF system noise figures in the under 3 dB region.

The transmitter modulator is about as simple as it is possible to conceive. The 1 volt peak to peak video signal is applied directly to the +1/+20 volt port on the Gunnplexer. A 500 ohm pot allows you to vary the modulating video signal voltage to prevent saturation. A 10K pot in the +8 volt Gunnplexer supply line allows you to walk the transmit frequency into the IF of the receiver. Ideally the walking should be on the receive end but that presents a new set of problems.

For those concerned about frequency stability, it has been our experience to date that for casual use you should not worry too much. At least not so much that it keeps you from getting on the air. The wideband video signal can move around quite a bit and still stay within the passband of the receiver. Remember that the stability is on the order of 350 kHz per degree C change; that if both units are in the same type of environment (i.e. both outdoors) then what affects one will affect the other as well. A pair have been run continuously for as long as 72 hours without touching the frequency walk control on the transmitter. For a sophisticated system that will run full time with 100 per cent reliability, some form of AFC is mandatory of course.

The simple modulator has been tested with various types of video sources for resolution and linearity. A 250-350 line camera will look as good through the system shown as it will directly through a local video loop system. There is some *measurable* phase change on a 4.2 MHz wide commercial signal (around 15-20 degrees) but it is not obvious to the eye if you run a colour video signal (such as you might *borrow* out of a colour TV set or from a VCR/BTR video output) through the modulator, Gunnplexer system and demodulator back into a colour monitor. To operate the transmitter, simply follow normal Gunnplexer set up instructions, conect a 1 volt peak to peak (max.) video signal to the input coax. connector and using the companion Gunnplexer receiver adjust the frequency control and the video level control (in that order) for best picture. If you happen to have a 4.5 MHz composite signal source handy (where the TV audio is modulating a 4.5 MHz oscillator that is mixed with the "raw" video signal) you can feed the composite (video plus audio) signal into the Gunnplexer as well. Keep the aural sub-carrier down

around 15 dB, however, to ensure that the audio doesn't cross hatch the video.

THE RECEIVER DEMOD

The receiver demodulator is more complex than the transmitter portion, but for anyone familiar with TV receivers *and* FM (receivers) it should present no special problems. Basically you have a 10K pot at the Gunnplexer to set the receive unit Gunn oscillator to the proper point to slot the IF output into the low noise, high gain video bandwidth IF strip. The well regulated supply shown is considered good engineering practice (on the transmitter as well) since stability of the LO is of some concern.

There are five stages of 41.25-45.75 MHz IF starting with the first J310 FET and running through an SD1006 and three 2N3563 stages. "Tip to tip" HP 2800 diodes form a limiter, followed by another pair in a wide band discriminator. The discriminator approach shown was selected because of the bandwidth involved; you don't want to frequency limit in the discriminator after going to this much trouble to get video through the package.

Following this are two stages of video amplification; another J310 and an output 2N3563 stage.

There are two warnings for the builder:

(1) Unless you have access to a sweep generator, with markers, there is almost no way to align the five stage high gain IF properly. When you get all done you will have in excess of 45 dB of IF gain here (48-52 typically) and it needs to be flat within 0.5 to 1.0 dB across the IF bandwidth. If you don't care about composite audio (4.5 MHz separated from the video) you could narrow the IF bandwith to around 3.0 to 3.2 MHz and pick up a few dB more gain. But don't try to run colour through a narrow bandwidth; it will smear and "ring" on you.

(2) Because of the relatively high gain and tight packaging, RF feedback *can* be a problem. The answer is good bypassing of power leads, always short RF leads, and don't mount the two boards (if that is the way you elect to go) so their RF parts face one another, i.e. put the copper of a board between the two open IF circuits.

Finally, note the two shields shown on the schematic. Don't neglect them.

Alignment follows TV IF textbook alignment procedures. When you have the gain in the right range and the bandpass between 3.0 MHz (for low resolution black and white cameras) to 4.5 MHz (+) (for colour or composite) the 500 ohm pot in the "aft" end of the discriminator circuit is adjusted for best drive level to the J310 video amplifier. You almost have to do this (once, then forget it) with the Gunnplexer video transmitter as a source, at close range (where the signal level/drive is high).

Just as you connected a video source (vidicon camera, test signal source such as a set of colour bars or a transparency via a flying spot scanner, out from a TV receiver detector, etc.) to the transmitter Gunnplexer, at the receiver you come out of the last video gain stage through the coaxial fitting to a video monitor. If you are passing composite video/audio, you will have to locate a second (4.5 MHz) discriminator here to recover audio as well. Or you could feed a TV channel "modulator" (RF signal source that will accept a composite input) to tune in your received signal on a standard TV receiver.

The 17 dB gain horn antennas are small, simple to use, and fun to play with. For *line of sight paths* of a few miles, they work just fine. The commercial people who insist on 99.97 per cent reliability *have* to see 40 dB signal excesses at the full limiting point or they are not happy. For amateur application, anything that is into limiting is adequate and should be noise free.

But for serious work you will want to graduate to surplus 2, 4, 6 or 8 foot dishes. Just remember how much more gain you get with a 2 foot dish (typically 16 dB more gain per antenna or 32 dB circuit gain) over the 17 dB gain horn antennas. By the time you get to 8 foot dishes on both ends you have picked up around another 8 dB circuit gain *per antenna* or 16 dB total path gain. That's a bunch.

But whereas the horn can be considerably off heading (the 3 dB beamwidth is broad enough that 10-15 degrees off doesn't make much difference) by the time you reach an 8 foot dish you are looking at 3 dB beamwidths on the nature of a degree or so. That makes finding the other guy a little tougher than with a horn. But the trade off is worth the effort if long hauls are your interest.

There are a few warnings concerning surplus dishes:

(1) The Gunnplexer has a "WR-90" flange (where the 17 dB horn bolts on). Common antenna feed fittings can be either WR-90 or WR-75 and they are not directly interchangeable.

(2) If the surplus dish you spot is not round, but elliptical and it has a shallow concave shape . . . it is not a parabolic at all. It is a passive reflector. They are cheap, *and useless* for direct illumination for our purposes.

Perhaps the best trade for (1) transportability, (2) gain, and (3) ease of handling are two foot dishes. With the exact equipment described in these application note sheets I cover a 20.3 mile path (line of sight of course) with full reliability. At the moment this circuit is being utilized to feed an alternate remote video/audio source back to the W5KHT shack where after demodulaton it is patched into the 439.25 MHz ATV rig. I wouldn't guarantee it would stay reliable in a heavy rainstorm but then I'm not Ma Bell either! ■

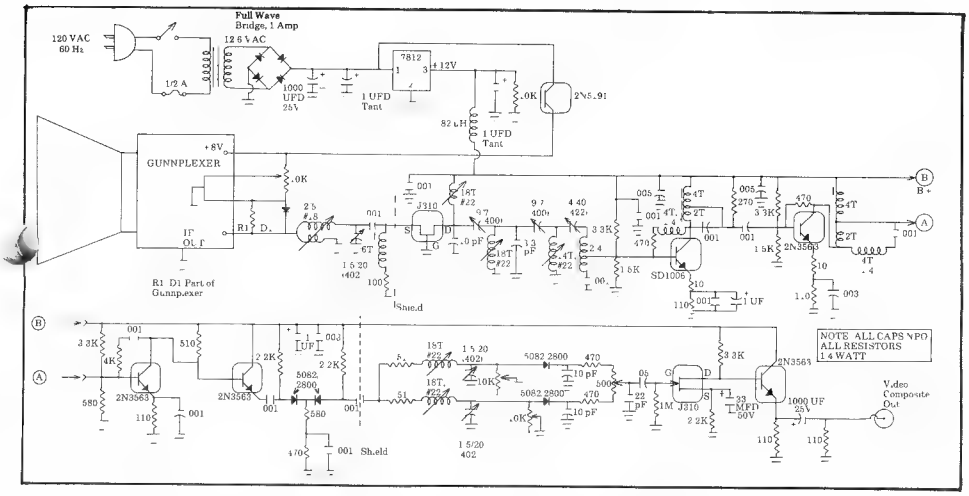


FIGURE 1: Video/Composite Demodulator.

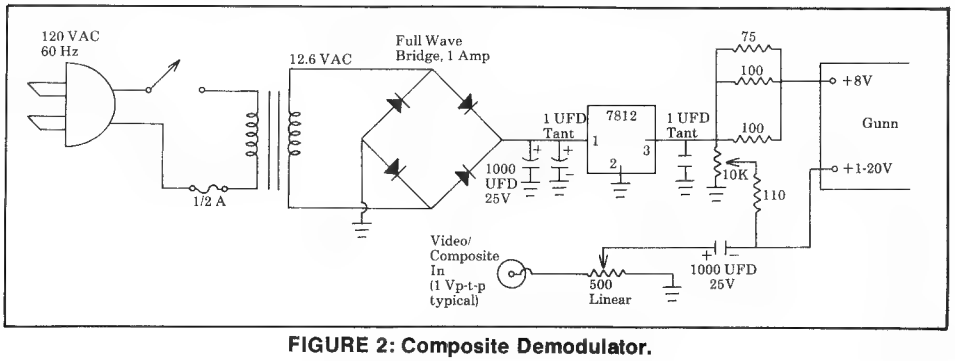


FIGURE 2: Composite Demodulator.

EMONA electronics

Head Office, Sales & Service: 23 JUDGE ST., RANDWICK 2031. Ph. 398 6378
City Branch: ROOM 208/661 GEORGE ST., SYDNEY 2000. Ph. 212 4815
Cable Address: EMONA Sydney. A.H. CALL 398 6378

MAIL ORDERS: Box K21, Haymarket NSW, 2000, Australia
WRITE, PHONE OR CALL IN!

!SPECIAL ANNOUNCEMENT — NEW RELEASE!

DON'T WASTE YOUR MONEY ON TRANSCEIVERS WITH HIGHLY INFLATED PRICES CURRENTLY AVAILABLE ON THE AUSTRALIAN MARKET!

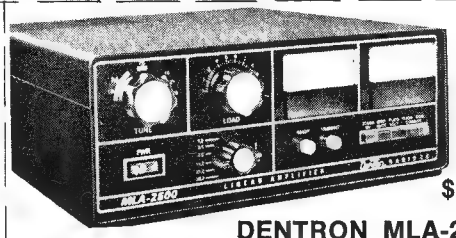
SAVE UP TO $400
WITH THE NEW DIGITAL
DenTron DTR-1 H.F. TRANSCEIVER

INTRODUCTORY PRICE AVAILABLE IN SEPT. 1978 **$725.00**

- All American Design and Components.
- 160-10 Metres, full coverage standard.
- Digital Readout, standard
- All Solid State Design.
- Plug-in PC Boards throughout.
- No-Shutdown Final Amplifier, works into any load.
- 2.1 kHz 8 pole SSB Filter, 9 MHz IF, standard.
- 500 Hz and 1 kHz active audio filters for CW, standard.
- RIT, 10 kHz overall bandwidth, 5 kHz of centre frequency.
- VOX, standard with front panel switchable PTT.
- 25 kHz calibrator, standard.
- Noise Blanker.
- Semi-break-in CW, with sidetone oscillator, standard.
- Separate speakers in DTR-1 and matching DTR-1-AC power supply.
- 250 Watts SSB CW.

LINEAR AMPLIFIERS:

DENTRON RADIO CO.: MLA-2500, 160-10m linear amplifier.
DENTRON RADIO CO.: MLA-1200, 80-10m linear amplifier.
DENTRON BIG DUMMY LOAD: 2kW — **$39.00.**
ANTENNA TUNERS — DENTRON 80-10AT **$84.00,**
DENTRON MT-3000A **$447.00.**
DENTRON 160-10AT **$186.00.**



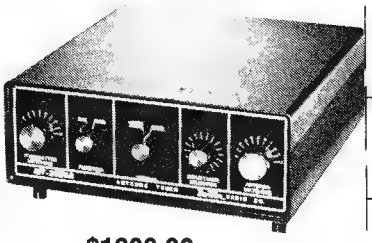
$269.50

DENTRON MLA-2500

DenTron Radio has packed all the features a linear amplifier should have into their new MLA-2500. Any Ham who works it can tell you the MLA-2500 really was built to make amateur radio more fun.

The MT-2000A

The Den-Tron MT-2000A antenna tuner, an economical full power tuner designed to handle virtually any type of antenna, whether it be a vertical, beam, quad, dipole, or long wire. The sleek styling and low profile of the MT-2000A is certainly beautiful, but be assured that isn't all you're buying. The MT-2000A is designed and engineered using heavy duty all-metal cabinetry and high quality American components throughout. When you consider the MT-2000A's unique features — front panel coax bypass switching, front panel lighting protection antenna grounding switch, 3 kW PEP handling capability and built-in 3 core balun for balanced feed line, we're sure you'll decide to buy American and stay with DenTron.



$1300.00

DenTron ANTENNAS:

ALL BAND DOUBLET **$39.00**

The Jr. MONITOR $103.50

Call it what you will — antenna tuner, transmatch, matchbox, or matching network, the JR. MONITOR has it all wrapped up in one neat 5¼ in. w. x 2¾ in. h. x 6 in. d. all metal cabinet. Think of the unlimited possibilities you'll have for experimenting with dozens of antennas! For instance, the DenTron All Band Doublet fed with balanced feed line hooked to the JR. MONITOR covers 1.8-30 MHz . . . or try this mobile suggestion: 108 in. mobile whip fed with coax to the JR. MONITOR located under the dash will give you 10-40 metre mobile coverage and no coils to change! Order Today.

- WRITE OR CALL FOR SPECIFICATIONS.
- **CHECK OUR MOST SENSIBLE PRICES.**

WE ARE AUSTRALIA-WIDE DISTRIBUTORS OF

DenTron PRODUCTS

AMATEUR PRODUCTS DEALERSHIPS FOR MANY AREAS ARE AVAILABLE!!!

EMONA electronics

Head Office, Sales & Service: 23 JUDGE ST., RANDWICK 2031. Ph. 398 6378
City Branch: ROOM 208/661 GEORGE ST., SYDNEY 2000. Ph. 212 4815
Cable Address: EMONA Sydney. A.H. CALL 398 6378

MAIL ORDERS: Box K21, Haymarket NSW, 2000, Australia
WRITE, PHONE OR CALL IN!

FROM **FDK** OF JAPAN COMES THE LATEST MILITARY TECHNOLOGY AT AMATEUR PRICES, THE

Bigear VHF-UHF TRANSCEIVERS!

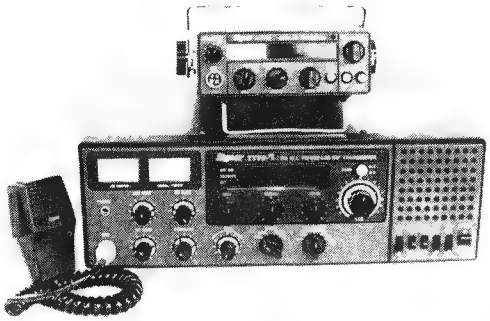
Type 1 —

2m FM SSB CW PLL SYNTHESIZED MOBILE BASE TRANSCEIVER $694

- 144 - 148 MHz, PLL digital synthesizer system
  FM: 800 channels (5 kHz step)
  SSB: 400 channels (10 kHz step) plus VXO system (± 7 kHz)
- AC 117/240V, DC 13.8V, two-step power supply
- Digital display system (using a large-sized LED) provides reading up to six figures

Type 2 — **2m FM PLL SYNTHESIZED MOBILE TRANSCEIVER $361**

- 144 - 148 MHz, PLL digital synthesizer system (800 channels)
- A large-sized LED, digital display system provides readings up to six figures
- Easy-operating separate and selective mechanism displayed by the frequency unit for wider operation
- Transmitting output: 25W/1W, two-step selector switch



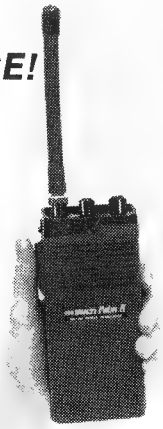
WRITE OR CALL FOR FURTHER SPECS!

FDK MULTI Palm II *NEW RELEASE!*

2m FM POCKET TRANSCEIVER

SPECIFICATIONS:

Transceive Frequency Range: 2 MHz in 144-148 MHz; Transceive Channels: 6 Channels; Mode of Operation: FM; Antenna Impedance: 50 Ohms unbalanced, BNC connector; Power Requirement: 12V DC (Negative Grounded); Power Consumption: Transmit 300 mA, Receive 100 mA, Stand-by 25 mA; Weight: 1.03 lbs. (470g); Repeater Offset: ± 600 kHz; Modulation: Variable Reactance phase modulation; Max. Deviation: ±5 kHz; Microphone: Condenser Microphone; Receiver: Double conversion superheterodyne (1st IF = 16.9 MHz, 2nd IF 455 kHz); Sensitivity: —4 dBu (NQ 20 dB); Audio Output: Maximum 0.3 Watts; Attachment: Rubber ducky antenna, Nicad battery pack, DC cable with cigarette lighter plug, Carrying strap.

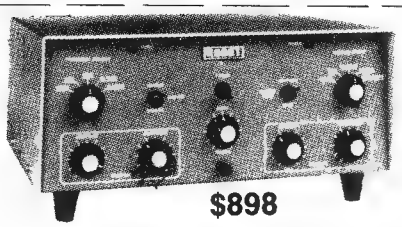


$199.90

FDK MULTI-800D NEW RELEASE: Latest Model with Up/Down Frequency Tuning Controls on the Microphone — $416

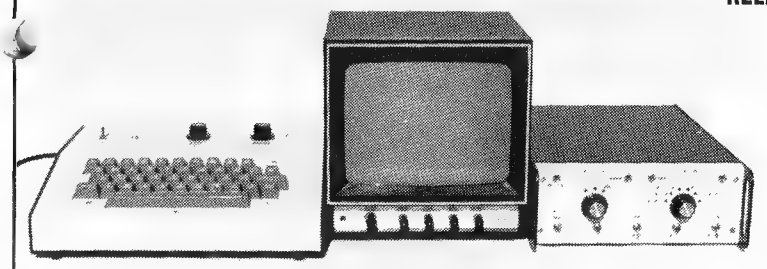
ANNOUNCING — FAMOUS MULTI 2700 $744
FM/SSB/CW/AM, VFO/SYNTHESISED TRANSCEIVER

Order Your ROBOT Model 400 SSTV CONVERTER NOW!



$898

With the Robot 400 you just plug it into your transceiver, connect a TV monitor or your home set with the optional Robot RF adapter kit, tune to 14.230, and you're operating SSTV.



RELAX AND ENJOY CW — Go RTTY Emona's Silent Way!

NEW INFO-TECH MODEL 200! $668
A complete system that converts Morse, RTTY and ASCII to Video, using Fairchild F-8 Microprocessor Technology! A good receiver and video monitor are all that is required!

NEW INFO-TECH MODEL 300! $564
A Microprocessor controlled, stand alone, keyboard that generates Morse, RTTY and ASCII codes.

NEW INFO-TECH RTTY EQUIPMENT:

Model 75 RTTY to Vlideo Converter	$448
Model 150 RTTY Keyboard	$407

YAESU

FT101E Transceiver	$839
FT301 Transceiver	$930
FT301D Transceiver	$1090
FP-301 AC Power Supply	$165
FRG-7 Receiver	$319
FL2100B Linear Amplifier	$565
FV-101B External VFO	$131
FTV-650 6-metre Transverter	$249
YO-100 Monitor Scope	$265
FV-301 External VFO	$131
YO-301 Monitor Scope	$335
YP-150 Dummy Load Watt Meter	$99

KENWOOD

TS-520S Transceiver	P.O.A.
TS-820 Transceiver	P.O.A.
TS-820S Transceiver	P.O.A.

LUNAR

HF3-100L2 Linear Amplifier	$245
Bi-Linear VHF Models	$259
28-432 MHz Low Noise Pre-amplifier	$42
In Line Switching 2m Pre-amplifier	$55
Oscar Box "J" Dual Freq., Oscar 8 Down Converter	$99.90

MIZUHO

SX-59 RF Pre-amplifier	$84
SX-1 Pre-selector	$63
DX555P Counter Generator	
KX-1 Coupler	$56
MX-1D Marker	$69
Pre-scaler for DX-555P	$39

ANTENNAS

Wilson — SY-1, 10-15-20m, 4 elem. Beam	$339
Wilson — SY-2, 10-15-20m, 3 elem. Beam	$279
Cushcraft—ATB-34, 10-15-20m, 3el. beam	$289
Hustler — 4 BTV w/80m Resonator, Vert. Antenna	$130

$139

NEW:

Medium-Sized Ham Antenna Rotator — FU 400. With approved power supply.

Constructed for long trouble-free operation. 200 kg vertical weight capacity. Extra heavy duty disc brake that prevents wind-milling.

MIDLAND ZONE CONVENTION

Graeme Stevens VK3ZSQ
Publicity Officer Midland Zone WIA Vic. Div.

On Sunday, February 26th, over 120 amateurs, families, and enthusiasts attended the Midland Zone Division of the WIA's convention held at Strathfieldsaye.

The official dinner to be held on the Saturday night was cancelled when only three official registration slips were lodged by the due date. An "unofficial dinner" was held Saturday night when approximately 40 people turned up for the week-end.

On Sunday morning the trade displays totalling approximately $45,000 were set up.

Fred Bail, as usual, was there, with a magnificent display of Yaesu equipment and accessories. Vicom also had a wide display with a lot of interest shown in the Singer Test Piece valued at a mere $10,000; doubtless to say, everyone bought at least one. Sumner Electronics, agents for Bail, Vicom and Dick Smith, had something for everyone, including those hard-to-get 77 call books.

Local trade house Bruce Cutting Electronics put on a display of Akai home hi fi equipment and a very interesting VTR. This was borrowed by the Dick Smith display, who had a camera monitor set up taking film of all the displays for promotional purposes, or was it for VK2ZIP who, unfortunately, wasn't there.

Moving on to the contests themselves, everyone had a load of fun.

Allan VK3BAY won the 2m Scramble, supposedly on Ch. 40, but a few QSYd to 50. Ah well, everyone knew everyone after that, the whole idea of the game. Allan's prize was an aerial donated by Scalar.

Allan's YL, Bernie, a very nice and quiet person who had only used a microphone the day before, won the Unlicensed 2m Scramble. Well done, Bernie.

Frank VK2AKG from Sydney was awarded a prize for the longest distance travelled.

Rod VK3NCX and company won the 2m sniffer hunt and were awarded with a 2m power amplifier kit donated by Bendigo's Sumner Electronics. Now he's hoping Novices can come up on 2m along with many of the Z calls.

The XYLs came into their own next, with Joan, XYL of Graem VK3AGS, hitting the nail the most times, winning the nail driving competition.

Barrie VK3ACT was wandering around all day with a small trimmer and a paper clip type inductance soldered across it. Neville VK3ACN came out of the paintwork and was closest to guessing the resonant frequency at approximately 196 MHz. (I still reckon it was in the Gigs, but . . .)

Trevor VK3YJT found the hidden 2m Tx and collected a multimeter for his effort.

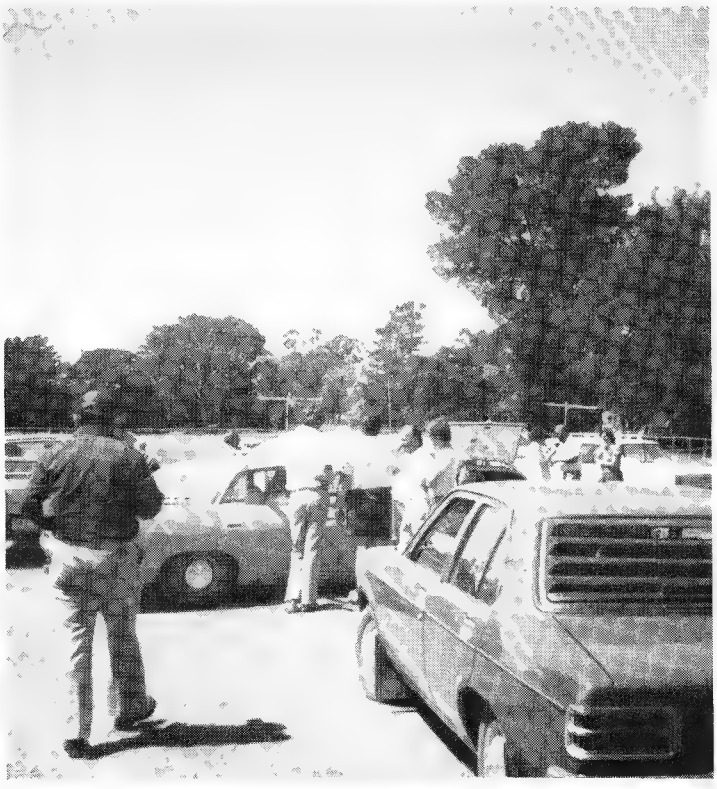
Allan VK3AER was awarded a capacitor and a rather large choke (20H) to help him overcome his 50 cycle type deviation. For guessing the inductance of this choke, VK3NAD was awarded a calculator donated by Bruce Cutting Electronics, Bendigo.

The hammer throwing (all 22s were hidden) for the YL and XYLs nearly came to a sticky end when I was taking a photo of the arm action of Joan (XYL VK3AGS) and the hammer was thrown at me. I'll forgive you. Raelene Lukies was the eventual winner and will be our entrant for the Olympics.

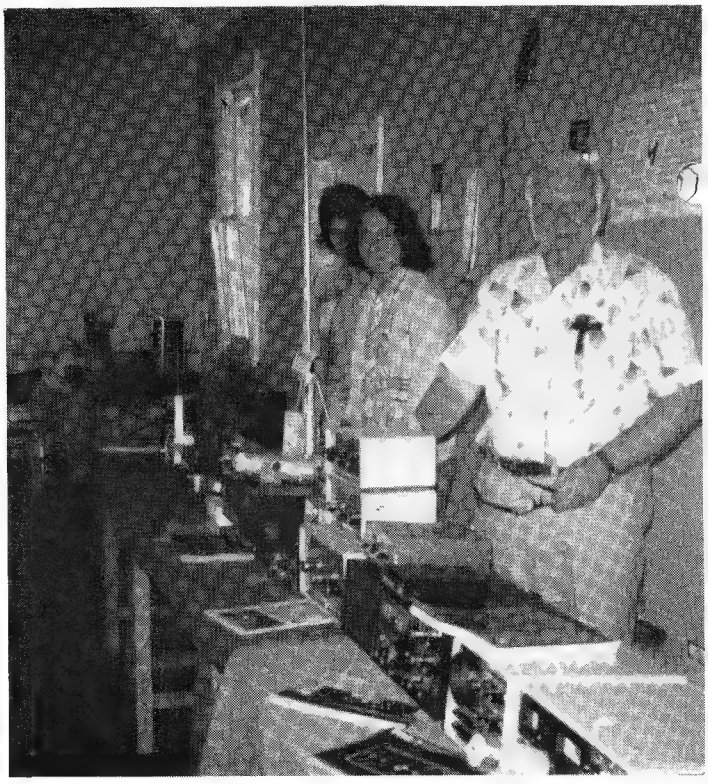
The 2m fox hunt was won by Trevor VK3YJT and was rewarded with a SWR meter donated by Sumner Electronics.

The 160m Mobile Rally was won by VK3CV and Fred Bail donated the prize of a SWR meter.

The Midland Zone would like to thank all those people who participated in the week-end, especially the business houses



Setting up for 2 Mx Sniffer Hunt



Bail Electronic Service with Fred and Assistants donated some Prizes

2 Mx Sniffer Hunt — VK3YJT with Hand-Held

Sumner Electronics Display — Donated some Prizes for Competitions

Bob VK3SD and Charlie VK3AUP and XYL's soaking up Sun, Dinner, and?

160 Mx Vertical and 3 el. 2 Mx Beam for talk in. Carol, XYL of VK3APB, unloading some of 800 Hamburgers consumed

who set up displays and donated prizes. A special mention for Bob VK3ZIM for the talk in, in which no one was lost, anyhow.

Daphne, XYL of VK3XO, was hard pressed taking the registration money and did a splendid job.

Carol, wife of Max VK3APB, the Club president, and the rest of the XYLs and YLs who supplied the cakes and the cuppas, and turned it on for everyone really made it a good week-end for those who attended.

Last but not least of all the Zone would like to thank Max VK3APB for all the work he did towards the running of the convention, storing the 400 odd hamburgers, etc., and attending to the BBQ, along with the secretary, Bill VK3FY.

MIDLAND ZONE WIA OFFICE-BEARERS

PRESIDENT: MAX VK3APB.

SECRETARY: BILL VK3FY.

TREASURER: BILL VK3XO.

MEETING PLACE: Club Rooms, Inglewood Street, Specimen Hill, Bendigo, 3rd Friday of the month.

ZONE REPEATER: Channel 4 VK3RAM, located Mt. Alexander.

ZONE NET: 2000 hrs. Mondays. Channel 4 Repeater.

ACTIVITIES: Lectures on AR every 2nd month. Possible AOCP and Novice courses. Tours of interest on AR are conducted also. ■

CAPE YORK SSTV DX-PEDITION

Stan Mudford VK3BHZ
Georges Creek Roadside, Tallangatta 3700

On 30th September, SWLs Reg, Les, Col, myself and son Steven set up camp on the Jardine River at Cape York, 600 miles north of Cairns. The three-day journey from Cairns had passed almost without incident despite the terrible pounding sustained by man and vehicle, the only mishap being the loss of the lid from the strawberry jam and the loss of refrigerant gas from the portable freezer, with the inevitable loss then of the rest of the meat supply. The purpose of the trip was to transmit the first ever SSTV video from the Cape.

During the setting up of our camp, we observed a thick pawl of smoke rising about 8 km to the south. Someone had been careless and started a bushfire. A decision was made to backburn the area on the southern side of the camp. This was achieved with help from a dozen or so other campers, and shortly afterwards the main fire reached the backburn area and subsided. Had we not taken this precaution, the fire would certainly have swept through the camp.

On Saturday morning a TH3JR triband beam with rotator was erected in a clearing some 30 metres from the operating tent. Reg and I then proceeded to string an 80m and 40m dipole between two trees. The wasps had other ideas but we eventually won.

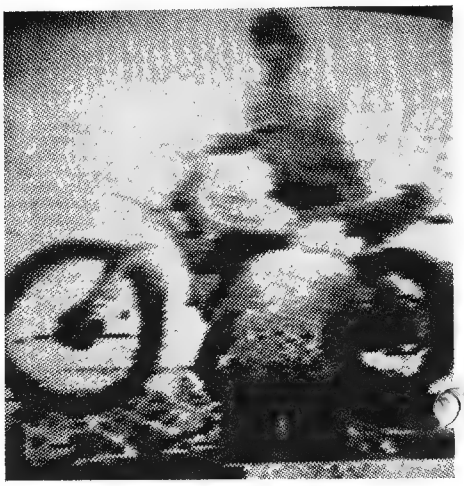
The equipment in the shack consisted of FT101, Robot 400 scanconverter, homebrew keyboard, fast scan camera, 14 in. fast scan monitor with outrigger for the polaroid camera, and a power distribution panel with voltmeter and frequency meter. The power source was a 2.5 kVA petrol driven alternator placed as far from the camp as the extension leads would permit.

Zero hour, the engine was fuelled and on the first pull kicked into life. A quick check revealed that all the gear was operational. At 1030 the words "CQ DE DXPEDITION CAPE YORK VK3BHZ" were typed up on the video keyboard and sent to air on 20 metres beaming south. The CQ was answered by John VK3LM in Melbourne who gave a 5 + 9 report. Video sequences showing our camp site and the Jardine River were received closed circuit by John. This contact was followed shortly afterwards with Mick VK6TV in Kellerberrin with good exchange of video.

During the two day expedition much interest was shown by the other campers, and at times the shack was full with visitors. Some of their XYLs agreed to sit in front of camera and have their picture recorded on cassette tape or transmitted to air. Video contacts were made with most VK States, ZL and JA.

The highlight being on the second day when I spoke to members of my family, who were on location at the VK3LM shack. We then posed in front of camera and were able to exchange good pictures of each other. Several polaroid pictures were made to record the occasion.

Technically, the expedition was a great success, with every piece of gear performing faultlessly (excepting the refrigerator). The low number of stations contacted was, however, disappointing. It was felt by the expedition members that the results achieved on the mission more than compensated for all the planning an deffort. My special thanks go to John VK3LM who publicised the event and assisted in so many other ways. ■



Off air photo of re-transmission by VK6TV of Yamaha motor cycle at Jardine River on 1.10.77.

Stan VK3BHZ on Closed Circuit on location

NOVICE NOTES

ETCHING CIRCUIT BOARDS

Roy Hartkopf VK3AOH
24 Toolangi Road, Alphington 3078

It is more than ten years since the writer first began etching circuit boards at home. It is amazing that many amateurs are still afraid to do their own and even more amazing that some leading radio books still publish misleading and even completely incorrect information. There are three basic ingredients for etching circuit boards successfully at home. First the correct materials. Second the correct method and then the correct finishing. We will deal with these in turn.

MATERIALS

The materials required are absurdly simple. Things like temperature controlled baths, mechanical agitators and the like may be all very well for laboratories — though unless you mass produce boards they are hardly necessary even there. But all that you will need at home can probably be found in the kitchen. One ordinary plastic bucket. A square plastic basin or baby bath large enough to stand the bucket in and finally some steel wool or an eraser (india rubber). The etching material is ferric chloride. In most cases you will be able to get a saturated solution of ferric chloride already made up. If not, then simply dissolve ferric chloride crystals in water until no more will dissolve and store it in a plastic polythene bottle.

The method of marking out the circuit board will not be mentioned here except to say that the writer has found that by far the best resistant material is what is called silk screen printers' ink. This is not really an ink, but a kind of flat paint which dissolves in turpentine and will wash off very cleanly and easily when the board is etched. It can be thinned down with turpentine — it is normally of a creamy consistency — until it flows without running and can be applied to the board with a draftsman's ruling pen. With this method lines from ⅛ inch down to less than 1/64 inch can be cleanly and easily drawn. The ink dries in a few minutes and if a mistake is made the ink can be scraped off the board with a sharp knife and no residue remains to prevent the copper being etched.

The ferric chloride is not deadly dangerous. You can pick out a board from the etch provided you wash your hands thoroughly immediately afterwards, but it should be treated with the greatest care just the same. If you are working near a stainless steel sink, remember it will etch and stain the steel. It will also cause your clothes to disintegrate in the same way that acid will. Treat it the way you would treat sulphuric acid — the acid used in automobile batteries.

METHOD

When the board is ready for etching, take the bottle of ferric chloride and carefully pour a **small** amount into the plastic bucket. I mean a **small** amount, just enough to cover the bottom of the bucket about ⅛ inch deep. Then half fill the plastic basin with hot water, the hotter the better, so long as it does not soften or melt the plastic bucket or the basin. Put the circuit board, copper side up, gently into the bucket in the etch. Don't drop it or you may get splashed. Then put a little hot water into the bucket so that the etch is diluted with about its own volume of water. Again the hotter the water, the better. If you wish you can add about a teaspoon full — *a plastic one* — of hydrochloric acid to the etch when you first put it in the bucket or alternatively after etching a couple of boards. It does help to keep the etch activated but the effect is not very great. Then letting the bucket rest, floating on the hot water in the basin, move it in such a way that the etch swirls round and washes over the circuit board which is lying copper side up in the bottom of the bucket. Use very much the same movement as you would when swirling the water round in a dish when panning for gold. There are two essentials for quick etching. The etch must be kept hot and it must move as quickly as possible over the surface of the copper. Using the method described you will begin to see the copper disappearing from the edges of the circuit board after a couple of minutes and after about five minutes or less the board will be completely etched. If you don't keep the etch swirling over the board it could take up to half an hour and you'll probably find the etch has soaked through the resist and the board is in a mess. But with the method described, you'll get a clean etch with even the finest lines with no undercutting and no marking of the remaining copper. A word of warning. Don't try to use Indian ink as a resist. It will probably wash off and ruin the board. Letraset can be used provided the copper surface is very clean and the Letraset is carefully burnished on. For large areas the copper can be covered with PVC adhesive tape.

If you follow the instructions about only using enough etch to just cover the board you will have no trouble in seeing when the board is etched. Take the bucket with the board in it outside and, lifting the board out, give it a good wash under the garden tap. Remove any PVC adhesive tape and rub both sides of the board to make sure all the etch is washed off. Then take the board and drop it into the plastic basin of hot water. Let it sit there for about five minutes while you put the bucket with the etch in some safe place where the baby and the cat can't get at it. There is no need to put the etch back into the bottle. If you cover the bucket with a piece of plywood or heavy cardboard and leave it in a safe place in the toolshed you can get it and use it any time. After it has been sitting in a fresh basin of hot water, the small amount of etch will soon get hot enough without having to add any more hot water to the etch itself. The etch can be used several times depending on the size of the boards and the amount of copper removed. A sign that the etch is becoming used up is that it will change from a brown to a green colour and the time for etching a board will increase. Used etch, by the way, makes a very good weed (and plant) killer.

FINISH

When you have taken the board out of the basin of hot water and dried it on a cloth, you can easily wash the silk screen ink off with a rag soaked in turpentine. Wipe it clean and dry and then give it a good rub over with steel wool or an eraser until the whole of the copper surface is shiny. Then wipe it completely clean with a lint free cloth and paint it immediately with a solution of resin dissolved in methylated spirits.

Resin is the stuff used in resin cored solder, for putting on the bow of a violin and by gymnasts to prevent their hands and shoes from slipping when they are doing acrobatics. You can get it from art and hardware stores and it is quite cheap. When the methylated spirits dries out (it is best to leave it overnight in a warm place) the board remains coated with a first class soldering flux and will never tarnish. Special preparations for coating circuit boards are available — some of them spray on — which will do the same job. They are equally effective but expensive.

And that is all there is to etching circuit boards. It is so quick, simple and inexpensive that once you have tried it, you will wonder why you did not do it years ago. ■

COLOUR CODES FOR THREE CORE MAINS LEADS

The old colour code for three core mains leads was —

Active — Red.
Neutral — Black.
Earth — Green.

A new colour code has been brought in with metric conversion and the adoption of new standards.

Active — Brown.
Neutral — Light Blue.
Earth — Green or Green/Yellow. ■

HELP

WITH INTRUDER WATCHING

Sideband Electronics Sales

Distributors of COMMUNICATIONS TRANSCEIVERS

H. F. TRANSCEIVERS

TRIO KENWOOD	T.S. 820 S	P.O.A.
TRIO KENWOOD	T.S. 520 S	P.O.A.
TRIO KENWOOD	V.F.O. 820	$185
TRIO KENWOOD	V.F.O. 520 S	$150
TRIO KENWOOD	S. P. 820	$ 65
TRIO KENWOOD Pan Display	B.S. 8	$ 60
TRIO KENWOOD Pan Display	B.S. 5	$ 60
TRIO KENWOOD	D.S. 1A	$ 79
TRIO KENWOOD Communication Receiver	R. 820	T.B.A.
TRIO KENWOOD	A.T. 200	$175
ANTENNA TUNER		
D. 5 Digital Display & Counter		$185
TRIO KENWOOD	T.R. 7400 A	$440
TRIO KENWOOD	P.S. – 8	
AC Power supply for T.R. 7400 A		$166
TRIO KENWOOD	S.M. 220	$319
Station Monitor Panoramic Adaptor optional		
TRIO KENWOOD Amplifier	T.L. 922 linear	T.B.A.

PLEASE WRITE FOR OUR VERY COMPETITIVE PRICES ON KENWOOD PRODUCTS. WE ALSO CARRY ALL SPARE PARTS FOR KENWOOD EQUIPMENT, BACKED BY FAST AND EFFICIENT SERVICING.

FROM F. D. K.

Multy Palm hand held 2M FM transceiver 6 channel Nicad battery charger very attractive	$199.90
F. D. K. Multy 2700	$744
F. D. K. Multy 800 – D latest model with new type remote control mic.	$416
F. D. K. type two 800 channels 25 watts output	$361

RTTY UNITS

DOVETRON MPC – 1000 – R – E	$1,200
HAL ST – 5000	$350
TELECODER: Similar to MPC 1000	$700
TELECODER 500	$300
INFOTECH Keyboard Mod 150	$397.50
INFOTECH Vidio Conv. Mod 75	$448
TELECODER Kit also available	
TSR – 500 Complete 200 character UART FIFO Regenerator	$250

Go RTTY with DOVETRON'S MPC - series multy path Diversity Terminal Units. The Rolls Royce of all terminal units. We are appointed distributors.

HAL ST 5000 – Economy terminal unit. 170-450-850- shifts.
We have locally built units for lower prices.
SOON AVAILABLE – SSTV with Robot 400 $898

VIDIO DISPLAY UNITS
KEY BOARDS – Write for PRICE DETAILS

DENTRON DTR-1 250 WATTS P.E.P. ALL AMERICAN MADE. SOLID STATE H.F. TRANSCEIVER 160 – 10 METRES, DIGITAL DISPLAY AND STANDARD PLUG IN P.C. BOARD. CONSTRUCTION 2.1 KC 8 POLE FILTER, 9 M.H.Z. IF 50 C/S AND 1 – KHZ ACTIVE AUDIO FILTER, STANDARD 25 KHZ CALIBRATOR VOX NOISE BLANKER IS STANDARD.
WRITE FOR MORE INFORMATION
ALL THESE EXCITING FEATURES FOR ONLY $725

AC Power supply for above $125

DENTRON MLA – 2500 Linear Amplifier	$1,300
DENTRON Antenna Tuners	
M.T. 3000A	$447
M.T. 2000A	$269.50
J.R. Monitor	$103.50

H.F. ANTENNAS

HUSTLER 4 – BTV vertical trap ant. 10 – 80	$130
WILSON: System one 4 element 3 band	$339
WILSON: System two 3 element 3 band	$279
HADAKA VS 40-80 Vertical	$115
HADAKA VS 33 Tribender	$265
HADAKA VS-22-3 Element 15-10 in balun	$173
HADAKA VS-RG Radial kit for VS 41	$33.50

SKY-BAND MOBILE HELICAL ANTENNAS

SKY 80 six feet long 3.5 MHz	$ 28
SKY 40 six feet long 7.060	$ 26
SKY 20 six feet long 14.150	$ 26
SKY 15 six feet long 21.100	$ 25
SKY 10 six feet long 28.500	$ 24

ANTENNA ROTATORS
F.U. 400 All approved with external low voltage supp. Other types soon available $139

YAESU MUSEN TRANSCEIVERS
PLEASE WRITE FOR VERY COMPETITIVE PRICES

CRYSTAL FILTER, 9MHz, similar to FT-200 ones. With carrier crystals. $ 35

AUSTRALIA'S SOLE DIST. OF KLM PRODUCTS

KLM SOLID STATE POWER AMPLIFIERS

(MHz)			
144-148	PA10 – 80BL	80	OUTPUT (watts)
"	PA10 – 140BL	140	"
"	PA 10 – 160BL	160	"
"	PA 2 – 70BL	70	"
400-470	PA10 – 70CL	70	"
	PA 2 – 12B	12	Watts
	PA 2 – 25BL	25	Watts P.O.A.

For personal attention: **24 KURRI STREET, LOFTUS**
P.O. BOX 184, SUTHERLAND, 2232 TELEPHONE: 521-7573

New Shipment expected soon.

SIDEBAND ELECTRONICS SALES **OPEN ON SATURDAYS TILL 12 NOON** PETER SCHULZ, VK2ZXL

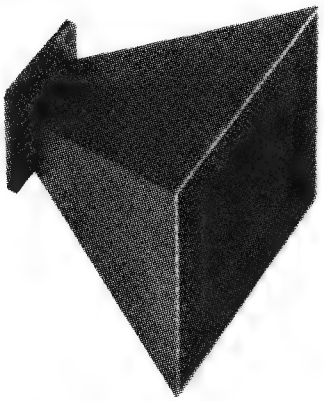
All prices quoted are net SYDNEY, N.S.W., on cash with order basis, sales tax included in all cases, but subject to changes without prior notice. ALL-RISK INSURANCE from now on free with all orders over $100; small orders add 50c for insurance. Allow for freight, postage or carriage; excess remitted will be refunded.

WERNER ELECTRONIC

AUSTRALIAN AGENTS

Microwave Associates

MA-87127



MA-86551

The MA-87127 series of frequency modulated transceiver "front ends" using Gunn oscillators and Schottky mixer diodes has been specially designed to operate in the amateur 10.0 to 10.5 GHz band.

Three models available with or without antenna:

MA-87127-1	.....	**output 15 mW**
MA-87127-2	.....	**output 25 mW**
MA-87127-3	.....	**output 40 mW**

WERNER ELECTRONIC Industries Pty. Ltd.

28 GRAY STREET, KILKENNY, S.A. 5009
Telephone (08) 268 2766
Telex AA88405

CUSTOM COMMUNICATIONS

HAM RADIO SPECIALISTS

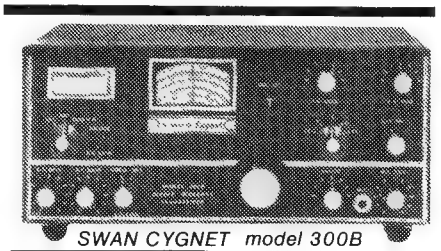
DRAKE TR—7

RITTY SYSTEMS
COMPLETE CONSISTS OF
PAGE PRINTER
TAPE REPERFORATOR
TAPE DISTRIBUTOR
DEMODULATOR
LOOP SUPPLY

WE SELL

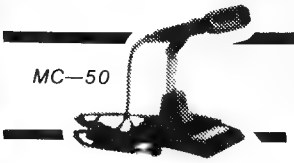
KENWOOD
YAESU
DRAKE
ICOM*
SWAN*
ATLAS

*AUSTRALIAN DISTRIBUTOR
• SYDNEY AGENT



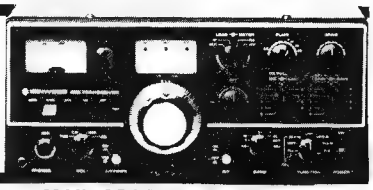
SWAN CYGNET model 300B

SPECIAL FEATURE
FREQUENT HAM AUCTIONS
PRODUCT NIGHTS
FULLY EQUIPPED
"DO IT YOURSELF"
WORKSHOP



MC—50

KENWOOD Transceiver RS—520S

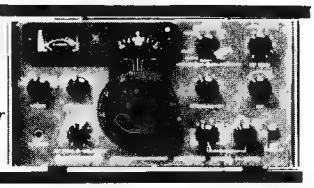


HAM RADIO SPECIALISTS
*
HF—VHF EQUIPMENT
*
RITTY UNITS
*
S.S.T.V.
*
NOVICE EQUIPMENT
*
ROTATORS
*
CB RADIO & ACCESSORIES
*
WORKSHOP
•REPAIRS
•TEST EQUIPMENT
•Do it yourself workshop
*
PRODUCT TRAINING & ADVICE

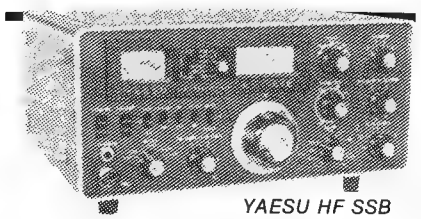
***WE TRADE IN AND AUCTION EQUIPMENT**

MAIL ORDER SERVICE
COUNTRY ENQUIRIES
WELCOME
ALL LETTERS ANSWERED

KENWOOD 599D Series Receiver



USED TEST INSTRUMENTS
LEVEL METERS
OSCILLIATORS, ETC.,
V.T.V.M.
MORSE, KEYS, ELECTRONIC
KEYERS, MATCHING NETWORK
HF AND VHF ANTENNAE



YAESU HF SSB FT—101E thru 10M

TOP TRADE ON USED HF EQUIPMENT

OPEN 6 DAYS
BANKCARD
EASY FINANCE

CUSTOM COMMUNICATIONS

6 ORCHARD LEIGH ST., VENNORA, N.S.W.

681 3544 AFTER HOURS **674 1719**

bail

DOES YOUR ANTENNA TURN IN THE WIND?

DOES YOUR CONTROL UNIT
'CUT-OUT' AFTER ONLY A FEW REVOLUTIONS?

. . . then step-up to a RELIABLE EMOTO ROTOR.

Bail Electronics are pleased to announce . . .
. . . an exciting range of ANTENNA ROTATORS by EMOTO ANTENNA Co. of Japan

EMOTO FEATURES
- ROBUST DESIGN
- HEAVY DUTY STAINLESS HARDWARE
- 100v. SUPPLY TO MOTOR REDUCES VOLTAGE/POWER-LOSS

COMPARISON OF ROTOR BRAKE TORQUE FIGURES (kg./cm.)

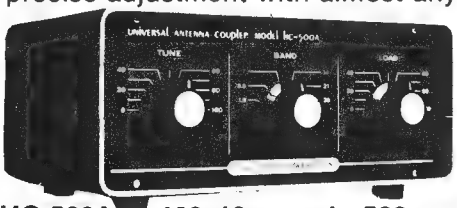
CDE model	Torque
CD44	1,152
HAM-2	4,025
Emoto model	
103 LBX	1,500
502 CXX	4,000
1102 MXX	10,000

We have been in the business long enough to know your requirements for a first class antenna rotor, and we have gone "over-board" for the EMOTO range! There are many brands of antenna rotors, some of them completely unsuitable for the majority of amateur applications, and for this reason we do not stock them.

Most likely your present antenna rotor will turn your antenna and hold satisfactorily, but it just will not hold it stationary under strong wind conditions; i.e. YOUR ROTATOR LACKS SUFFICIENT BRAKE TORQUE, the ability to hold the antenna still whilst a gale is blowing. **HERE IS WHERE THE EMOTO SCORES.** Take a close look at the comparison figures above. Then compare the prices of all the rotors and you will have to agree that the EMOTO 103 LBX, EMOTO 502 CXX and EMOTO 1102 MXX are the best value.
Finally, EMOTO ANTENNA CO., is not a new company. They have been making rotors for many years. Have no fears about this being a new and untried product!

Universal® antenna couplers

Extremely important, especially with modern all-solid state transceivers, is the maintenance of a very low SWR to avoid destruction of costly high-power P.A. transistors. An antenna coupler enables precise adjustment with almost any antenna.



(S.W. or co-ax.)

HC 500A — 160-10m, up to 500w pep
(also available — not illustrated)
HC 2500 — 160-10m, up to 2.5kw pep
HC-75 — 80-10m, up to 75w pep
HC 250 — 80-10m, up to 200w pep
KW E-ZEE Match — 80-10m, up to 400w pep
FC 301 Yaesu — 160-10m, up to 500w pep

Now an addition to YAESU'S range of measuring instruments . . .

QTR-24
24 hour World Clock

QTR-24

Yaesu has now made an addition to their already well known range of measuring instruments, it is the QTR-24, a 24 hour World Clock. With a glance the time in any principal city or time zone can be simultaneously co-ordinated with local time on a 24 Hour basis. The QTR-24 is powered by a 1.5V dry cell, which has a normal life of approximately one year. No amateur or SWL station could be complete without one

Our years of handling and specializing in this equipment have enabled us to build up a fund of knowledge and technical experience, backed by a comprehensive range of spare parts and service facilities. We don't just sell a set, our concern extends throughout the life of your equipment.

Contact us for details of other Yaesu equipment plus the accessories required to complete your station.

All equipment from Bail's carries a 90-day warranty and complete service back-up.

JAS7879-1

bail **ELECTRONIC SERVICES**

FRED BAIL VK3YS
JIM BAIL VK3ABA

60 Shannon St., Box Hill North, Vic., 3129.
Ph. (03) 89 2213

Yaesu Agents in Australia since 1963

Radio amateur equipment from B.E.S also sold by —

W.A.	Radio Communication Services, H. R. PRIDE, 26 Lockhart St., Como, 6152	Ph 450 4379
	WILLIS TRADING CO., 429 Murray Street, Perth 6000	Ph 21 7609
S.A.	FARMERS RADIO PTY. LTD., 20 Stanley St., Plympton 5038	Ph 293 2155
TAS	G. T. ELECTRONICS, 131 Westbury Rd., South Launceston 7200	Ph 44 4773
	PRINS RADIO, 123 Argyle Street, Hobart 7000	Ph. 34 6912
N.S.W.	Aviation Tooling, STEPHEN KUHL, 104 Robey St., Mascot 2020	Ph. 667 1650
	Amateur & Novice Comm. Supplies, W. E. BRODIE, 23 Dalray Street, Seven Hills 2147	Ph. 624 2691
	DIGITRONICS, 186 Parry St., Newcastle West 2302	Ph 69 2040
	RIVERCOM, Sid Ward, 9 Copland St., Wagga Wagga 2650	Ph. 21 2125
QLD.	H. C. BARLOW, 92 Charles St., Aitkenvale, Townsville 4814	Ph 79 8179
	MITCHELL RADIO CO., 59 Albion Rd., Albion 4010	Ph 57 6830
A.C.T.	QUICKTRONIC, Jim Bland, Shop 11, Altree Crt., Phillip 2606	Ph. 81 2824 82 2864

A wish come true . . . from Yaesu to you — the FT-901DM

YAESU

bail

The Radio of Tomorrow Here Today

Delux HF Transceiver FT-901 DM has it all. Only the "DM" model has **all** the usual "options" as **standard** components

Features

* Unique receiver filtering system with rejection tuning, dual-filter variable-width IF bandpass tuning, and a variable audio peak control for maximum selectivity.
* Built-in Curtis 8043 IC Keyer, which provides excellent immunity from RF interference. Semi break-in with side-tone.
* Advanced noise blanker.
* Digital readout utilizing bright LED's. Memory system allows you to store any transmit or receive frequency, then recall it with a flick of the switch.
* RF speech processor.
* Rugged 6146 final tubes, toroidal output circuitry, and RF negative feedback for maximum reliability and purity of emissions. PLL frequency generation for state-of-the-art stability.
* 25 kHz crystal calibrator and +5 kHz clarifier for transmit and receive frequencies.
* Built-in VOX with front panel gain control.
* **Selectable AGC system: SLOW-FAST-OFF.**
* Built-in speaker.
* 180 watts DC input for SSB/CW, and 80 watts for AM/FSK/FM.
* Choice of supply voltages 100/110/117/200/220/234 plus DC-DC converter for 13.5 VDC for mobile.

Specifications

GENERAL
Frequency range: All amateur bands — 160m through 10m; WWV 5MHz; plus aux. position for extra band.
Power requirements: AC 45 watts to 320 watts max. **DC** 13.5 V—5.0 A to 21 A max (1.1 A Heater off)
Write for detailed colour leaflet on the 901 DM.
Size: 342(W) x 154(H) x 324(D) mm
Weight: 18 kg
TRANSMITTER
Emission: LSB, USB (A3j), AM (A3h), CW (A1), FM (F3), and FSK (F1)
PA input power: A1, A3j—180 watts DC, A3h, F3, F1—80 watts DC
Carrier suppression: Better than 40 dB
Unwanted sideband suppression: Better than 50 dB @ 1000 Hz
Spurious radiation: Better than 40 dB below rated output
Transmitter frequency response: 300—2700 Hz (—6 dB)
3rd order distortion products: Better than 31 dB below rated output
Stability: Less than 300 Hz drift from a cold start; less than 100 Hz drift over a 30 minute period after warm-up.
Negative feedback: 6 dB at 14 MHz
Antenna output impedance: 50—75 Ohms.
Microphone impedance: 500—600 Ohms.
RECEIVER
Sensitivity: 0.25 uV for S/N 10 dB
Image rejection: 1.8—21 MHz—better than 60 dB, 28 MHz—better than 50 dB
IF rejection: Better than 70 dB
Selectivity: WIDTH control at "0" SSB —6 dB: 2.4 KHz, —60 dB: 4.0 KHz; CW/FSK (with optional CW filter installed) —6 dB: 6 KHz, —60 dB: 12 KHz; FM —6 dB: 12 KHz, —60 dB: 24 KHz
Passband tuning: Continuous from 2.4 KHz to 300 Hz
Cross modulation rejection: Better than 80 dB immunity at 20 KHz off 20 dB input at 14 MHz
Desensitization: Better than 90 dB immunity at 20 KHz off 20 dB input at 14 MHz
Audio output: Better than 3 watts @ 10% THD. Audio output 4—16 Ohms

Our years of handling and specializing in this equipment have enabled us to build up a fund of knowledge and technical experience, backed by a comprehensive range of spare parts and service facilities. We don't just sell a set, our concern extends throughout the life of your equipment.

Contact us for details of other Yaesu equipment plus the accessories required to complete your station.

All equipment from Bail's carries a 90-day warranty and complete service back-up.

JAS7778-58

bail **ELECTRONIC SERVICES**

FRED BAIL VK3YS
JIM BAIL VK3ABA

60 Shannon St., Box Hill North, Vic., 3129.
Ph. (03) 89 2213

Yaesu Agents in Australia since 1963

Radio amateur equipment from B.E.S. also sold by —

W.A.	Radio Communication Services, H. R. PRIDE, 26 Lockhart St., Como, 6152	Ph. 450 4379
	WILLIS TRADING CO., 429 Murray Street, Perth 6000	Ph. 21 7609
S.A.	FARMERS RADIO PTY. LTD., 20 Stanley St., Plympton 5038	Ph. 293 2155
TAS.	G. T. ELECTRONICS, 131 Westbury Rd., South Launceston 7200	Ph. 44 4773
	PRINS RADIO, 123 Argyle Street, Hobart 7000	Ph. 34 6912
N.S.W.	Aviation Tooling, STEPHEN KUHL, 104 Robey St., Mascot 2020	Ph. 667 1650
	Amateur & Novice Comm. Supplies, W. E. BRODIE, 23 Dalray Street, Seven Hills 2147	Ph. 624 2691
	DIGITRONICS, 186 Parry St., Newcastle West 2302	Ph. 69 2040
	RIVERCOM, Sid Ward, 9 Copland St., Wagga Wagga 2650	Ph. 21 2125
QLD.	H. C. BARLOW, 92 Charles St., Aitkenvale, Townsville 4814	Ph. 79 8179
	MITCHELL RADIO CO., 59 Albion Rd., Albion 4010	Ph. 57 6830
A.C.T.	QUICKTRONIC, Jim Bland, Shop 11, Altree Crt., Phillip 2606	Ph. 81 2824, 82 2864

TECHNICAL CORRESPONDENCE

LF COHERER RECEIVER

Dear Sir,

I was very interested in the picture of the receiver shown on page 13 of the AR for March 1978.

I had not seen this picture before, so decided to study it and analyse its set-up, to convince myself whether it is genuine or not.

I enclose a sketch with my identification of its components, suitably indicated.

From this I have deduced the circuit of the receiver as I see it.

The additional loading inductance may seem unnecessary, but it must be remembered that the aerial was to be used with a balloon or a kite, as high as possible, as Marconi had proved in his early experiments the higher the aerial the louder the signals.

It must also be remembered that Oliver Lodge and Alexander Muirhead in England, and Karl Ferdinand Braun, the inventor of the Cathode Ray Oscilloscope, in Germany, had all obtained patents before Marconi, in 1900, obtained his famous "Four Sevens Patent", so all were already using tuned circuits and loose coupling between the spark-gap circuit and the aerial circuit.

The installation of a receiving station at South Wellfleet, on Cape Cod, Mass., in the United States, was destroyed by a tremendous storm, so Marconi and his two assistants sailed to Newfoundland, where he improvised a receiving station on a plateau called Signal Hills, near St. Johns.

After two balloons had burst and one kite been blown away, the second kite took the aerial to a height of 130 metres.

To bring such a long wire into tune with the secondary circuit the approximate amount of inductance would be inserted in the aerial circuit and then resonance be obtained with the variable condenser.

Ambrose Fleming had been employed in developing the power supply and the transmitter at Poldhu, but it is doubtful if he had yet developed his Cymometer (wave meter), as there does not seem to be any record of the wavelength of the Poldhu signals. The power generator was designed to provide 10 kW output but my old friend Kemp, who was with Marconi at Signal Hill, told me it was probably overloaded to 12 kW and that was the chief reason that only dots were sent, as if long dashes were sent, the generator might burn out.

Although the actual wavelength employed may not be known, it must be taken that Marconi would have made certain that the closed circuit in the receiver would have been adjusted to that of the transmitter before it left Poldhu.

A very sensitive relay is shown in the picture to operate the morse inker (not shown), thus giving a permanent record of the received signals. However, it appears the signals received were not strong enough to operate the relay so the Branly coherer was replaced by an "Italian Navy Coherer". This consists of two plugs of iron or carbon separated by a gap of a few millimetres into which a drop of mercury was introduced. A small battery ("A" on the picture) was placed in series with this coherer and the relay and inker replaced by an ordinary telephone receiver.

Persons sceptical of the success of Marconi's tests were shortly afterwards convinced when, homeward bound, Marconi on the US liner Philadelphia received messages from Poldhu at nearly 3500 km distance, equivalent to the distance to Cape Cod.

It appears to me that the photo is either of the genuine receiver used or a good replica. I believe the former, as the absence of the morse inker, the presence of the telephone receiver and the single dry battery to operate the special coherer all add to enforce this belief.

Newton Wade VK4QW.

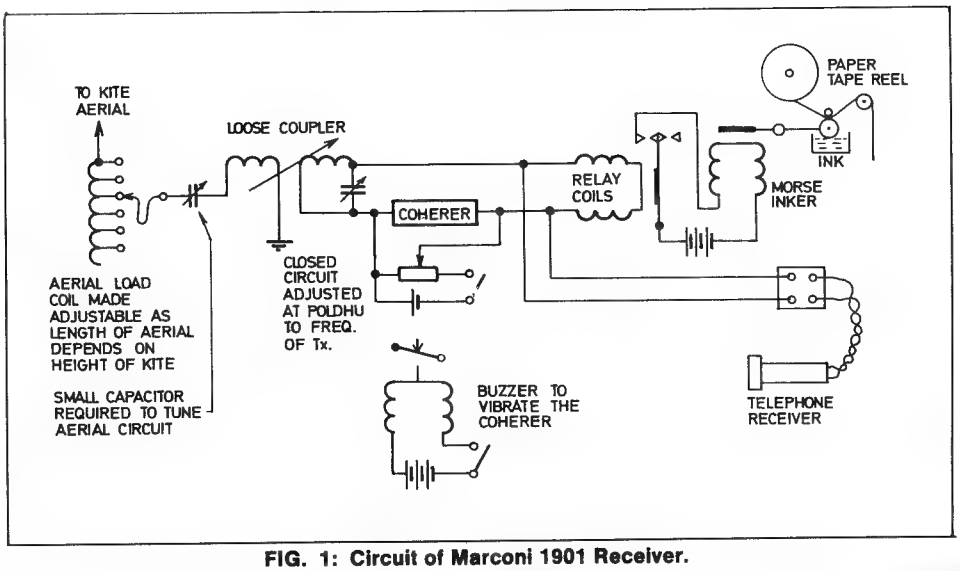

TO KITE AERIAL
LOOSE COUPLER
PAPER TAPE REEL
INK
MORSE INKER
RELAY COILS
COHERER
CLOSED CIRCUIT ADJUSTED AT POLDHU TO FREQ. OF Tx.
AERIAL LOAD COIL MADE ADJUSTABLE AS LENGTH OF AERIAL DEPENDS ON HEIGHT OF KITE
SMALL CAPACITOR REQUIRED TO TUNE AERIAL CIRCUIT
BUZZER TO VIBRATE THE COHERER
TELEPHONE RECEIVER

FIG. 1: Circuit of Marconi 1901 Receiver.

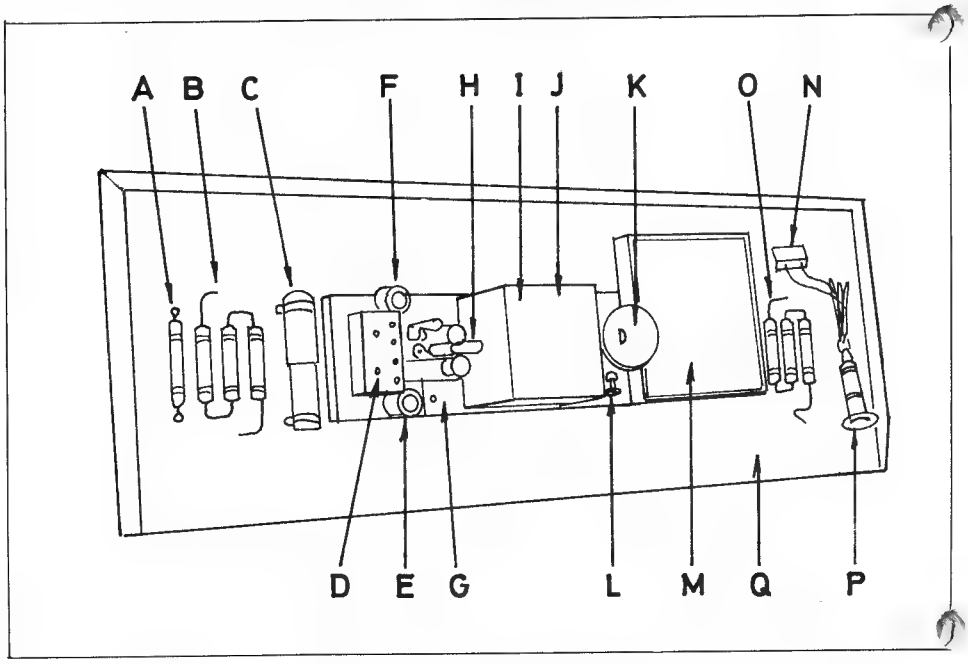


FIG. 2: Component Identification.

A Single dry cell, for use with the Coherer.
B Three dry cells in series to operate vibrator G.
C Probably a variable capacitor using glass tubes.
D Antenna loading inductance, with 6 tappings.
E Antenna terminals.
F Terminals to take the end of a tapping lead with clips to fit on to tappings of aerial inductance.
G Buzzer vibrator to de-cohere the Coherer.
H Part of the Coherer.
I Screened box containing loose

coupler between the aerial circuit.
Note: The closed circuit will have been tuned to resonance with the Poldhu transmitter before leaving and this box protects it by "fiddlers" who cannot resist from being altered in transit or turning a knob if accessible.

J Probably a variable capacitor or inductance for the purpose of tuning the closed circuit.

K Sensitive polarized relay with adjusting screw L.

L To adjust the position and pressure of the relay contact.

M Empty tray — previously used for the "Morse Inker" worked by the relay contacts and battery O.

N Terminal block for telephone leads — connected across the relay coils. To be used if signals too weak to operate the relay.

O Three dry cells in series.

P Telephone receiver.

Q Table top — probably with folding legs or for use with trestles. ■

Dear Sir,

Subsequent to writing the article on phase modulation (AR June 1978) I have made several modifications to the circuits published to achieve improved performance.

These are as follows:

1. Fig. 2. Phase Modulator.
   (a) Replace the 100k ohm feedback resistors of IC1 and IC2 with 1M ohm resistors.
   (b) Change the 330 pF capacitor to a 33 pF capacitor.
   (c) Change a 0.0047 uF capacitor between VR1 and the microphone connector.
   (d) Change the 100k ohm resistor between IC1 and IC2 to 470k ohm and insert a 0.047 uF capacitor in series.
2. Fig. 4. Frequency Modulator Circuit.
   (a) Insert a 0.0047 uF capacitor between the microphone and the 250k ohm potentiometer.
   (b) Change the 100k ohm feedback resistors of IC1 and IC2 to 1M ohm resistors.
   (c) Change the 10k ohm resistor between IC1 and IC2 to a 270k ohm resistor.

Yours faithfully,

I. F. Berwick VK3ALZ. ■

428 Ligar Street,
Ballarat, Vic. 3350.
June 27, 1978.

The Editor,

Dear Sir,

In "Letters to the Editor" of June AR, reference was made by Bruce VK5OR to information missing from my article on 160m multiband antennas published in AR April 1978. The information Bruce requested is as follows:—

(1) The dimension missing from Fig. 1 is that for the 160m "tail". This dimension is approximately 40 feet or 12.4m. It was in the original MSS but did not appear on the diagram as published.

(2) Bruce draws attention to a point which I had overlooked completely: the **reference points** for the dimensions of the wire sections of the antennae in both Fig. 1 and Fig. 2 are not specified. I hasten to apologize for the omission but I fear that I am not now able to supply any exact information. The best I can do is to say that I measured the wire sections up to the **ends** of the traps, which were each about eight to nine inches in length. Again I stress that these dimensions are given purely as a guide and should not be regarded as a blueprint.

Yours faithfully,

Arthur Solomon VK3LJ. ■

AROUND THE TRADE

TRIO-KENWOOD COMMUNICATIONS COMES TO AUSTRALIA

Trio-Kenwood (Australia) Pty. Ltd. was established in August 1977 and commenced operations in October 1977 to distribute the Hi Fi products of its Parent Company, Trio Kenwood Corporation of Japan.

More recently Trio-Kenwood Communications (TKC) Division was registered as a subsidiary of Trio-Kenwood (Australia) Pty. Ltd. (TKA). Both are wholly owned by the Japanese manufacturer but managed and staffed by Australians with the aid of key personnel on loan from Japan, and on May 5th this new company launched into the Amateur Communications market with a dedicated objective of providing "Professional facilities to Amateur Radio Operators".

Administration and accounts will be through the main Australian Company (TKA) at 30 Whiting Street, Artarmon, NSW, but the Communications Company (TKC) has its own premises, including warehouse, showroom, offices, services department and spare parts store, across the street at 31 Whiting Street, Artarmon.

TKC is drawing on the world marketing and servicing expertise of its parent company and multi-national subsidiaries to establish stock, spare parts and servicing facilities which will adequately support the excellence of design and execution for which Kenwood Communications products are famous.

Any one of our staff members is waiting for the opportunity to prove that "Kenwood is the Pacesetter in Amateur Radio".

Just phone (02) 439 4322 — Heather will direct you to the right answer. ■

WARC 79 WARC 79 WARC 79

REPORT *ALL* INTRUDERS TO THE INTRUDER WATCH CO-ORDINATOR IN YOUR STATE

WARC 79 WARC 79 WARC 79

LARA

Ladies Amateur Radio Association

This month, apart from celebrating LARA's **third** birthday, at the end of July, we introduce another in the series of well-known YL operators, Clarice Adams VK3UE. Clarice formerly held the call VK3VB, which she obtained in 1948, but has changed her call to that of her husband, Stan, to carry on the daily "UE Net" after Stan's recent death. Until four years ago, Clarice and Stan had a Box Hill QTH, which must have been a busy place. Participants in the Jamboree of the Air will remember it, as will their many visitors, amateurs and others. Unlike Austine 3YL and Mavis 3KS, Clarice has not been active in the field of awards and competitions. She denies any proficiency in Morse other than as a means of impressing grandsons with one's own importance. An active career as an accountant, interrupted by arrivals such as two sons and a daughter, is now being followed by an equally active career as a grandmother and retired lady of leisure!

Clarice now lives in Eltham, next door to one of her sons, in a house surrounded by trees. As an amateur, of course, she lives on a hill with a spectacular view, and the house is easily identified by tower and aerials at one end.

During her life, Clarice has enjoyed radio a great deal. She points out that it is an ideal hobby for a house-bound young mother with toddlers, providing an accessible refuge from baby-talk.

Another rewarding facet of their hobby was the contact Clarice and Stan were able to maintain on 2 metres during Stan's long stay in the Austin Hospital. Yet another benefit comes with the host of radio friendships made over the years and visiting and being visited by these friends. Clarice points out that having been born in Mullimbimby and spent a hectic childhood travelling, she is immune to travel-itch and prefers to **be** visited rather than visit.

An amusing sideline to this history is that Clarice, who gained her AOCP by diligent study and memory work, starting as a complete novice, scored a higher mark in the exam than Stan — the family "technical expert" — an encouragement to all our novice YLs who are also starting at the beginning.

Good luck to all in the exams.

33s, Kate Duncan. ■

DIVISIONAL NOTES

VK2

TRIAL NOVICE EXAMINATION

It is the turn of the WIA (NSW) Education Service to conduct the next trial Novice Examination prior to the October, 1978, Official Tests by the Post and Telecommunications Department.

The date for the trial will be on Saturday, 16th September, 1978, starting at 2 p.m.

Course instructors and individual candidates are asked to indicate in writing their intentions to participate. Letters should be sent to:—

The Education Officer,
WIA (NSW) Education Officer,
P.O. Box 109, Toongabbie, NSW 2146.

Clubs and courses are asked to support this trial novice effort, which will be the first WIA-conducted examination based on the new Novice Syllabus issued by the Department of Post and Telecommunications.

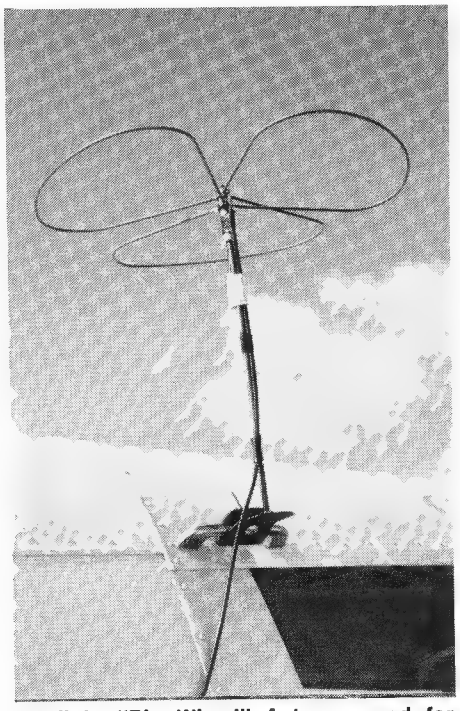
An examination fee of one dollar per candidate will be payable to meet the considerable costs of conducting this examination. Cheques, Money Orders and Postal Orders should be made out to "WIA (NSW) Education Service" — and not to any specific person. Full details of this operation will be sent in ample time to make adequate local arrangements. ■

SUPPORT OUR ADVERTISERS
WHEN PURCHASING GOODS,
SAY YOU SAW THEM ADVERTISED IN **AR**

ATV PICTURES FROM THE SKY

On Sunday, 11th June, listeners to the Wireless Institute morning broadcast in Melbourne were informed that they might expect to see fast scan ATV pictures emanating from a Piper Cherokee flying over Port Philip Bay. Indeed, reports of excellent strength pictures came pouring in from all over Melbourne. Aboard the plane, Alan VK3ZTV had his hands full manipulating the camera and handling reports coming in on the 2 metre ATV liaison channel Victor 1. He was aided by Graham, an observer, while Peter VK3YLK, whose camera and transmitter were used in the experiment, did an admirable job of piloting the aircraft.

Alan and Peter, both flyers, had thought of such a transmission many weeks before. It was envisaged that, as well as providing local viewers with interesting aerial shots, the experiment may also provide a method of transmitting ATV pictures on the 70 cm band over a great distance. Several problems had to be overcome. Firstly, how to provide a suitable power source in the aircraft to power simultaneously the camera, the 10 watt ATV transmitter and modulator, a 19 cm picture monitor, and the 2 metre transceiver. After land based experiments it was decided to run the 2 metre rig and the camera from the aircraft 12 volt supply, and the ATV transmitter, which draws 4 amps, from a car battery carried on board for the purpose. The camera and picture monitor, built for 240 volt operation, were modified for 12 volts.



The little "Big Wheel" Antenna used for ATV Transmission, mounted on the aircraft.

Next came the antenna. Since most ATV transmitters operate through high gain beams, it was thought that the low gain that would be afforded by an omni-directional antenna mounted on the plane might severely limit the signal available for ATV viewers. Some thought was given to a beam mounted on the aicraft but the idea was discarded as impractical. Alan suggested and built a "big wheel" (clover leaf) antenna which was to be mounted on top of the aircraft (actually clamped to the hand hold since it was not possible to drill or bolt any device on to the hired plane). A test transmission was made by Alan from a car atop Arthur's Seat at Dromana. Peter and Ken VK3NJ recorded the successful test transmission which was received at strength 2 in Springvale, nearly 40 miles away.

Final preparations were made on the morning of the flight and a zoom lens to replace Peter's fixed lens for his camera was hastily borrowed from Chic VK3YMA. Chic also organised some publicity for the event. Pictures were first transmitted at 1100 hours as the plane prepared to taxi on to the runway at Moorabbin. Ken, who recorded the event from his base station in Springvale, reported strength 2 pictures which quickly changed to strength 5 as the plane left the ground. Other ATV enthusiasts now realised that there were pictures on the air just before it was announced over the WI broadcast and other video recorders were switched on. Peter VK3BFG recorded some excellent pictures which he later re-broadcast.

It was unfortunate that several problems were evident. The major one was interference in the form of a venetian blind effect on the picture caused by the aircraft's alternator. Another was that the camera field rate, running without the aid of mains locking, was slightly off its normal 50 Hz rate which caused problems in some monitors and VTRs, and finally some RF feedback was evident at times. But notwithstanding, reports from the ground were excellent, most indicating reception of 4 to 5 strength pictures. Over 20 stations called the aircraft. Les VK3ZBJ went on the air for three minutes to provide pictures from the ground to the plane as it flew over his house in Frankston. Towards the end of the flight the plane's alternator was switched off, eliminating the horizontal band pattern which was somewhat spoiling the pictures. Peter landed the plane safely at 1205 and several ATVers found they could still receive pictures from the aircraft on the ground. In all, a very entertaining morning for Melbourne's ATVers and possibly a first of its kind in Australia.

A second aerial transmission on Sunday, 25th June, overcame the major problems

Alan VK3ZTV beside the gear used for the ATV Transmission.

of the first, however a new camera, this time with built-in electronic viewfinder, proved to be susceptible to RF feedback due to the proximity of the antenna with the camera in the aircraft. ATVers gave good reports of the by now nicknamed "Flying Circus" as pictures were rediated from over Port Philip Bay near Mornington. Melbourne's ATV enthusiasts can look forward to future aeronautical mobile transmissions, as Peter and Alan have advised that the series is not yet over. ■

COMMERCIAL KINKS

RON FISHER
VK3OM

The new Kenwood TS-520 must be one of the most popular of the new transceivers. Mr. V. Kitney VK6VK is obviously an operator who takes advantage of many modes and has adapted his TS-520 to accommodate his special needs. I am sure that many readers will find them of interest.

TS520S MODIFICATIONS

Having purchased a new transceiver, I found that some modifications would be necessary to make the unit compatible with my existing station layout. The following is a resume of the work undertaken.

MODIFICATIONS

1. To permit remote transmit-receive control.
2. To disconnect final filaments when transverter RF output is used.
3. To permit frequency shift keying of the VFO for RTTY operation.
4. To maintain receiver in USB mode while using CW mode for RTTY operation.
5. To change Xverter RF output to high impedance.

METHODS

1. Remote transmit-receive control is obtained by dressing a thin shielded lead from pin SS on VOX unit to pin 11 on the

Xverter multiway socket. Remote return to earth is via pin 9 on the Xverter multiway socket. Ground the shielded lead both at pin 9 and at the VOX board.

2. Remove the two filament wires from pin H on final unit board. Between the ground portion of the board and the freshly removed wires, use a .047 ceramic capacitor as a stand-off support. Obtain some lightweight twin flex wire and connect the pair one side to pin H and the other side to the "hot" side of the .047 capacitor. Carefully thread the twin flex along the loom towards the eight pin remote socket on the rear panel, and connect the ends to pins 2 and 7. It is now necessary to use an eight pin plug with a jumper lead wired between pins 2 and 7 to complete the filament circuit to the final for normal operation.

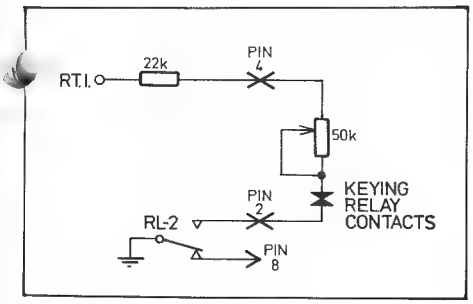


FIGURE 1

3. Frequency shift keying is achieved by connecting one end of a 22K resistor at pin RT 1 on the AVR board; the other end of the resistor has a thin wire threaded along an existing loom to the Xverter multiway socket pin 4. An external FSK control is made up using a small piece of veroboard glued to the multiway plug and mounting a 50K tab pot on the board to set the frequency shift. The return circuit for FSK is via pin 2 of the Xverter socket and the spare contact on RL 2. To gain access to RL 2 it is necessary to remove the exhaust fan from the rear panel. Carefully solder and sleeve the connection of a thin wire to the spare contact of the relay, and then thread the lead via an existing loom to pin 2 of the Xverter socket. FSK is prevented from affecting the received signal by the action of RL 2. (This is clarified by referring to diagram A.) Use the RIT function to offset the receiver during FSK reception.

4. For FSK reception refer to CAR unit. Remove the lead from pin CWR and reconnect to pin USB.

5. The Xverter RF output is changed to high impedance by removing the coaxial centre lead from the RCA socket. Connect a 10 pF creamic capacitor from pin 5 of the final tube socket to the centre pin of the RCA RF output socket.

CONCLUSION

The above modifications have permitted greater flexibility in the use of the TS502S in my situation. Perhaps these changes will give you some ideas to try.

THE KEN KP202

It's quite some time since we have discussed this little transceiver in Commercial Kinks. As I use my Ken mainly for monitoring the local repeaters on receive only, its low output on transmit did not become obvious until I was preparing the rig for an aeronautical expedition to the Northern Territory. The low output referred to is not low output from the transmitter, but the ability of the whip antenna to convert the transmitter output to useful RF. The problem seems to be that the whip or the short helical atenna has no ground plane to work against. Add a ground plane and the radiated RF increases by about 15 dB. Well of course it's just not convenient to attach a normal ground plane to a Ken, but it is easy to connect 48 cm (19 inches) of flexible wire to the earth side of the antenna connector. Just let this hang down and then note the improved reports. I have tried to reduce the length of this ground plane by introducing loading but so far without much success. However, this all explains why the ICOM IC-215 will outperform the Ken. The microphone lead on the 215 provides an excellent ground plane effect. Next month some modifications for the Yaesu FT-75. ■

20 YEARS AGO

Ron Fisher, VK3OM

AUGUST 1958

Justification was the theme of the Editorial page of the August 1958 Amateur Radio. Federal Executive questioned the old saying of "Use them or lose them". They point out that just because a band sounds dead at one particular location this does not indicate overall activity. Amateurs are using the bands all right, they said, and they will therefore be justified in expecting to maintain the bands they have after the next ITU Conference.

The CHL Modulation System. Don Haberecht VK2RS described a new form of carrier controlled screen grid modulation. Advantages claimed included simplicity of construction and setting up and more effective modulation. This was achieved by running the modulated stage to a higher than normal peak input. CHL modulation was not recommended for use on the HF bands as it could cause some splatter.

Remember the 288 MHz band? It was still with us in 1958, and J. Occolowitz VK3ZAI described a crystal controlled converter with 6 to 14 MHz output for use on that band. Four 6J6s were used.

Part six of Amateur Television by Eric Cornelius described the master monitor and its associated regulated power supply.

The overtone crystal oscillator was widely used in VHF gear during the fifties. Bob Winch VK2OA showed how they worked and how to get them working — not always an easy job.

An all band crystal converter with one crystal or 80 to 2 metres with an 8.8 MHz crystal and a receiver tuning range of 12 to 16 MHz. The author preferred to remain anonymous.

Meet the other amateur and his station featured Hans Ruckert VK2AOU. Hans was and still is well known for his antenna articles. All the gear was home built and, going on the list of achievements, worked as well as it looked. One full page was devoted to acknowledging donations to the ITU fund, with a total to date of over $2,000. ■

REPEATERS

MT. GININI REPEATER 7

As most amateurs will probably now be aware, the VK1RGI channel 7 repeater installation on Mt. Ginini was broken into some time early Saturday morning, 1st April, and the repeater stolen. The thieves stole the entire kit, including the duplexer assembly, and left only the antenna system intact. To gain access to the repeater itself, the thieves cut through a chain securing the compound gate and then cut a hole in the side of the building housing the repeater, thereby thwarting the existing alarm facilities. It was a very neat, professional job and care was taken to ensure that the repeater was removed as a unit — only two hardwired cables were cut in the removal operation. Co-sited University electronic equipment was not touched, which strongly suggests that the unit was not merely taken for stripping into parts. It would also appear that spite or malice was not the motive, as a much more dramatic demonstration of this would have been the unit's destruction in situ. In fact we can think of no rational reason for this theft. If the intention of the thieves was to re-use the repeater (suggested by its careful removal), whether on an illegal or legal basis, the number of scanning receivers around the place, and together with the amount of publicity this theft has and will continue to receive, then its operation must surely be detected in time. Additionally, the skill and sophisticated test equipment required to change the repeater's operating frequency would defeat all but a very few highly qualified people who may want to change its channelling. Maybe the problem is that we are looking for some sort of rational reason for this theft and are ignoring the fact that it could be some twisted person's idea of an April Fool's Day "joke". The police are continuing their investigations and any information, even rumours, regarding the theft should be passed on to them via Eric VK1EP, who is maintaining liaison with them.

Well, whatever the reason for the theft, we are now down one repeater. At the committee meeting held on April 3rd, it was decided that as a matter of priority another repeater be installed at the same site, this time with additional security measures. An appeal was also launched to cover the costs associated with the new repeater construction and genuine volunteers to help in the construction work have been called for. Peter Smith VK1DS, the "father" of VK1RGI, selflessly insisted on designing and building a replacement rather than buying commercial gear. The VK1 Division already owes Peter an immeasurable debt thanks for his three and more years spent designing and constructing both (VK1RAC, VK1RGI), and we should all show our appreciation firstly in cold hard cash terms for the duplexer assembly and, secondly, by spreading the workload over more people — just because you don't have fancy qualifications doesn't mean you can't help — your contribution in hauling materials up to the site, etc., is just as important in getting the new repeater installed as wiring up the various boards. Please contact Peter if you can help in ANY way — but please be prepared to honour your commitments when the time comes.

From "Forward Bias". ■

TRADE HAMADS

For a very long time commercial advertising has not been accepted in AR Hamads, but as the result of discussions at the 1978 Federal Convention a decision was made to open up a "Hamads-Trade" section. The rate will be $10 for 4 lines plus $2 per line (or part thereof), minimum charge $10, prepayable. Copy is required by the first day of the month preceding publication. This will mean that in future ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes. ■

New Release $295

TRANSVERTER MODEL MMT 432/144S
UTILIZING an IF of 144MHz * 10 WATTS DRIVE of ½ WATT * VOX OPERATED, TWO SELECTABLE RANGES
FEATURES EXTENDED COVERAGE FOR OSCAR 8

This 432 solid state linear transverter is intended for use with a 144 MHz transceiver to produce a high reliability transceive capability. A 10 watt load and RF sensing network eliminates the need for any anciliary circuitry. A single coaxial connection is all that is required between the transverter and the associated 144 MHz transceiver.

A wide range of applications is offered by the MMT432/114 transverter, which by virtue of its linear mode of operation will enable 144 MHz SSB, FM, AM or CW equipment to be used at 432 MHz. to 436 MHz.

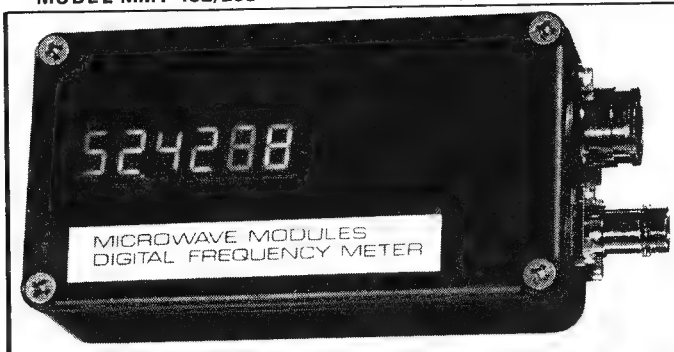
Simply connect direct to your 2 metre rig, 12 volt supply, fit 70 cm antenna for instant SSB, FM, AM, CW operation, coverage 432-434/434-436 in two ranges.

FEATURES: High quality double-sided glass fibre printed board * Highly stable zener controlled oscillator stages * PIN diode aerial changeover relay with less than 0.2 dB through loss * Extremely low noise receive converter, typical 3 dB * Separate receive converter output gives independent receiver facility * Built in Automatic RF VOX with override facility * Built in 10 watt 144 MHz termination, selectable attenuator for ½ watt * Use of the latest state of the art Power Amplifier transistors provide reliable 10 watts continuous output

MODEL MMT432/144S Price $295

TRANSVERTER MODEL MMT 432/28S Features extended coverage for Oscar 8
Second Crystal Oscillator gives two ranges: Low 432 – 434 MHz – High 434 – 436 MHz. Programming available to either Transmit/Receive both Low, both High, or a mixture of the two. Adjustable Drive Level is now provided by an input potentiometer. Optional RF VOX. Power Output 10 watts minimum * 28 MHz IF * Drive 1 mW to 500 mW * Aerial Changeover by PIN diode switch * Modern Microstrip Techniques * Power requirements 12 volt nominal at 150 mA 2.5 amp. peak * Case size 187 x 120 x 53 cm * Spare 432 input socket.

MODEL MMT 432/28S Price: $245 **MODEL MMT 144/28 Price: $185**



500 MHz COUNTER Model MMD050/500

SPECIFICATION:

Digit Height	10 mm
Display Width	45 mm
Case Size	111 x 60 x 27 mm
Frequency Ranges	0.45 - 50 MHz, 50 - 500 MHz Better than 50 mV RMS over 0.45 - 50 MHz. Better than 200 mV RMS over 50 - 500 MHz
Input Connector	50 ohm BNC
Input Impedence	200 ohm approximately
Power Connector	5 pin 270 deg. locking DIN socket (supplied with plug).
Power Requirements	11 - 15 volts DC at 300 mA approximately

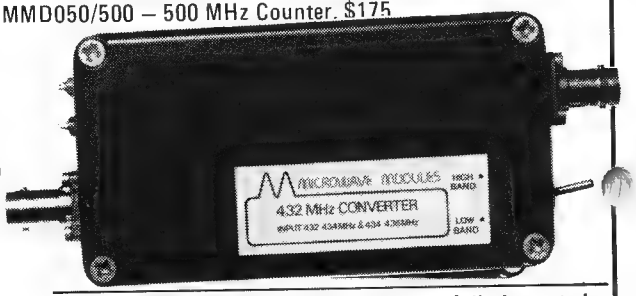
Model MMD050/500 – 500 MHz Counter. $175

DUAL RANGE 432 – 434 MHz & 434 – 436 MHz CONVERTER
TYPE: MMC432/ 28S & MMC 432/144S **Price: $67.00**

FEATURES:
* Extra Range (434-436 MHz) For Satellite Reception
* Ultra Low-Noise First RF Amplifier Stage
* Highly Stable Zener Diode Controlled Crystal Oscillator and Multiplier Stages

SPECIFICATIONS:

Input frequency ranges:	432-434 MHz (low) 434-436 MHz (high)
I.F. output frequency:	28-30 MHz or 144.146 MHz
Typical gain:	30dB
Noise figure:	3dB Maximum
D.C. Power requirements:	11-13.8 volts 12.5V nominal
Current consumption:	50 mA Maximum



BNC CONNECTORS – Excellent quality, fully imported from U.K. – U.S. Mil. No. UG88E/U. Price: $1.35 each.

NEW READY-TO-OPERATE MODULES AVAILABLE IN THE SALES PROGRAM OF VHF COMMUNICATIONS.
All modules are enclosed in black cast-aluminium cases of 13cm by 6cm by 13cm and are fitted with BNC connectors. Input and output impedance is 50 ohms. Completely professional technology, manufacture, and alignment. Extremely suitable for operation via sattelite or for normal VHF/UHF communications.

6 METRE MOSFET CONVERTER
Featuring 24 MHz local oscillator output for transverter use:

Input frequency:	52-54 MHz
I.F. Output Frequency :	20-30 MHz
Typical Gain:	30 dB
Noise Figure:	2.5 dB
Typical Image rejectoin:	65 dB

Crystal Oscillator Frequency: 24 MHz
Power requirements: 12 volt ± 25% at 35 mA.
MODEL MMC52/28LO Price: $49.00

1296 MHz CONVERTER
Mircostripline, Schottky diode mixer.
IF: 28-30 MHz or 144-146 MHz
Noise figure: typ. 8.5 dB
Overall gain 25 dB **Price: $65.00**

CONVERTERS
PACK & POST $2.00

144 MHz MOSFET CONVERTER
Noise figure: typ. 2.8 dB.
Overall gain: typ. 30 dB.
IF: 28-30 MHz. 9-15 V 20 mA.
Price: $45.00

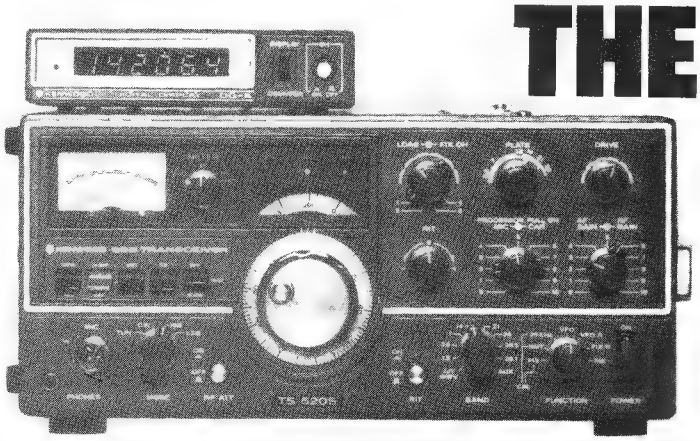
VARACTOR TRIPLER 432/1296
Max. input at 432 MHz. 24 W (FM, CW) - 12 W (AM)
Max output at 1296 MHz: 14 W
Price: $74.00

AMATEUR ELECTONIC IMPORTS IS THE EXCLUSIVE AUSTRALIAN DISTRIBUTORS FOR THESE PRECISION BRITISH MADE UNITS FROM MICROWAVE MODULES LTD.

All prices subject to change without notice. Onwards forwarding please add sufficient for freight or postage. Excess will be refunded.

Amateur Electronic Imports
P.O. BOX 160, KOGARAH. N.S.W. 2217
TELEPHONE: (02) 547-1467
CABLE: "AMATEURIMPORT, SYDNEY"

THE NEW TS 520S



KENWOOD
... pacesetter in amateur radio

A NEW STANDARD IN ECONOMY TRANSCEIVERS

Full coverage 1.8 to 29.7 MHz * Outstanding Receiver Sensitivity and Minimum Cross Modulation * Vernier Tuning for Plate Control * Highly effective Noise Blanker * New Improved Speech Processor * RF Attenuator *Easy connection to Phone Patch * Fully compatible for optional 6-Digit Read-out * Price: TS 520S **$685**

KENWOOD SM - 220 STATION MONITOR	P.O.A.
KENWOOD BS - 5 and BS - 8 PAN ADAPTOR FOR USE WITH SM - 220 and TS520/TS820	P.O.A.
KENWOOD DG - 5 DIGITAL DISPLAY FOR TS520S	P.O.A.
KENWOOD AT - 200 ANTENNA TUNER UNIT	**$169**
ICOM MODEL IC - 211	**$750**
YAESU FL - 2100B LINEAR	**$565**
YAESU FT - 225RD, 2 meter transceiver	P.O.A.
YAESU FT - 625D, 6 meter transceiver	P.O.A.
YAESU FT - 901 DM	P.O.A.
SWR METERS	
TWIN METER – 3.5 to 145 MHz	**$ 28**
BNC CONNECTORS – Mil. Spec.	**$1.35 each**

ALL PRICES SUBJECT TO CHANGE WITHOUT NOTICE
ONWARDS forwarding. Please add sufficient for freight or postage, excess will be refunded.

FOR AMATEUR EQUIPMENT BASED ON COMPETITIVE PRICES, PHONE OR WRITE TO:—

Amateur Electronic Imports

P.O. BOX 160, KOGARAH. N.S.W. 2217
TELEPHONE: (02) 547-1467
CABLE: "AMATEURIMPORT, SYDNEY"

YAESU and KENWOOD

FT-101, FR-101, FT-301
TS-520, TS-820

CW Ops!

Since all CW Filters are optional, why not get the best? This new sharp filter is ideal for DX and contest work; yet not TOO narrow for regular operation. Superior to audio filters, yet works well with them to improve receiver performance, if desired.

Mounts easily on circuit boards, pre-drilled for this purpose by the manufacturer. See your manual for installation instructions.

A BUILD-IN component; not a **HANG-ON.**

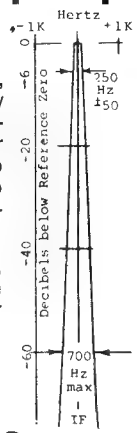
No alignment required.

Satisfaction guaranteed.

NEW!

FROM

F
PP



Compare!

250 Hz
COMPACT XTAL FILTER

$57 POSTAGE PAID

Have the BEST and SAVE!

WIN YOUR BATTLE AGAINST QRM

Mail your order, indicating type of rig and quantity required, with cheque or money order.

Allow up to 4 weeks for delivery.

FREE QUOTES to retailers for quantity orders of crystals and crystal-filters.

PIEZO ELECTRIC PRODUCTS

7 JASPER STREET, GREYSTANES, 2145, N.S.W. 631-4946

"SHURE"

(MADE IN USA)

Communications Microphone

MODEL 401A
High Impedance

Price **$37.50**
(Posted anywhere)

Model 401 Series hand-held communications microphones are compact size, CONTROLLED MAGNETIC R units designed for clear, crisp, natural voice response of high intelligibility.

CLEAN TRANSMISSION IS
"SHURE"
WITH THIS MICROPHONE

WILLIAM WILLIS & Co. Pty. Ltd.

MANUFACTURERS AND IMPORTERS
77 CANTERBURY ROAD, CANTERBURY, VIC. 3216
PHONE 836 0707

BUY DIRECT FROM THE IMPORTER?

GFS electronic imports

WHY NOT WHEN WE OFFER YOU : —

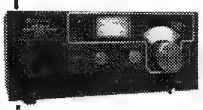
lower prices as well as 90 day warranty, pre-sales checked sets and back up service.

GREG WHITER
VK3CA

At GFS you have the choice of either YAESU or KENWOOD and, because we buy direct from Japan, (not just from a local distributor) we are in a position to sell to you at lower prices. Both brands are supplied with English handbooks, wired for 230—240 Volts AC and have 3-Core AC power cables with Australian Standard 3-pin plugs. So don't be confused by "Community Service Announcements". For a high quality product and personal service call GFS.

HF WADLEY LOOP COMMUNICATION RECEIVER

STANDARD C-6500



A state of the art communication receiver covering the range 0.5-30MHz using a Wadley Loop for rock solid stability. Unlike some other receivers that use only one filter in the IF and exhibit poor selectivity, The C 6500 has two filters, giving good selectivity on SSB and AM. For more details write to us for a brochure. **Only $299**

WHY PAY MORE FOR YAESU AND KENWOOD

FT-101E	160-10M 260W TCVR	$ 859
FT-901DM	160-10M 200W TCVR	$1485
FT-7	80-10M 25W TCVR	$ 548
FT-301S	80 10M 25W TCVR	$ 719
FT-301	160-10M 200W TCVR	$ 949
FT-301D	Digital 200W TCVR	$1149
FP-301	20 Amp 301 Series PS	$ 169
FL-2100B	80-10m Linear Amp	$ 554
YO-301	301 Series Monitorscope	$ 375
YO-100	101 Series Monitorscope	$ 263
YP-150	Dummy Load/Wattmeter	$ 99
FRG-7000	Digital Comm Rx	$ 685
TS-520S	120-10m 200W TCVR	$ 719

NEW!!

250Kz CW Crystal Filters to suit popular transceivers

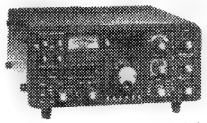
Type 3F-250SY to suit Yaesu 101 Series **$47.50**

Type 33H-250 to suit Kenwood TS-520S **$45.50**

THE INCREDIBLE FT-901DM

Why pay $1,499.50 for the FT-901D with just some options when you can get the real thing, the FT-901DM, from GFS for only

$1,485.00

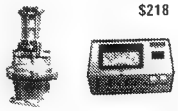


The FT-901DM is an amateur's dream come true. A few of its many features are Memory VFO, Variable IF Band Width, Built in Electronic Keyer and Many More. **Only $1485**

EMOTATOR ROTATORS

MODEL 103LBX Medium duty.
Rotation torque 450 Kg.cm
Brake torque 1500 Kg/cm
$145

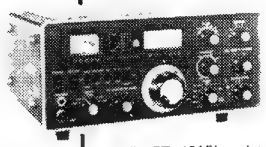
MODEL 502CXX Heavy duty.
Rotation torque - 600 Kg/cm
Brake torque - 4000 Kg.cm
$218



MODEL 1102MXX Extra Heavy Duty
Rotation torque 800 Kg/cm
Brake torque -10 000 Kg/cm
$317

1211 Mast Clamp for 103LBX **$ 17**
1213 Mast Clamp for 502CXX **$ 27**
1215 Mast Clamp for 1102MXX **$ 42**

FAMOUS YAESU FT-101E TRANSCEIVER



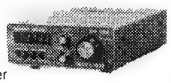
Yaesu's latest model FT 101E from GFS comes to you at a price that is very hard to beat.

For Instant 260 watts PEP operation on 160 through 10 metres just add 12 Volts DC or 234 Volts AC.

The FT 101E's updated RF SPEECH PROCESSOR provides that extra 'talk power' needed to cut through most of those bad pile ups and heavy QRM. **Only $859**

IS THERE A DX-555D FREQUENCY COUNTER /SIGNAL GENERATOR IN YOUR SHACK?

If not now is the time to update your test gear with this popular instrument.



Featuring a 220 MHz counter upper limit and 30 MHz generator upper limit.

Generator frequency is read directly on the counter.

A MUST FOR EVERY HAM SHACK.
$213

Technical Data:
10Hz to 220MHz counter.
0.4 to 30 MHz generator.
600Hz tone oscillator.
2mS and 200mS gating time.
5 Digit LED display.
Switchable KHz and MHz

DX-555 same as DX 555D but with 30MHz counter $175
DX-5P 220MHz pre-scaler for DX-555 **$49**

MORSE CODE KEYS

GFS ARE NOW STOCKING THE WELL KNOWN HI-MOUND BRAND OF MORSE CODE KEYS

HK-710	Commercial quality Key	$42.00
HK-704	High quality Key	$16.80
COK-1	Code Practice Oscillator	$12.50

KB-105 80-10 METRE TRAPPED VERTICAL

The KB-105 is supplied complete with guy ropes and radial traps, which are optional extras with many other brands
KB-105 80 10MX **$124**

FINANCE AVAILABLE TO APPROVED PURCHASERS *

ACCESSORIES FROM GFS

FS-302 VHF In line power and SWR meter, 50 170MHz – **$58**
SWR-15 SWR, Field strength meter 3 5 to 150MHz – **$15.50.**
SWR 200 Osker Block SWR POWER meter **$69**
QTR-24 24 Hour World Clock **$31**
LP-30 low pass filter, 50W power capability. Ideal for novice use - **$9.50.**
VS-1 mini m.c compressor, 46dB of compression - **$25.**
MC-801 Katsumi mic compressor **$45.**

GFS — EXPERT SERVICE

MANY YEARS OF EXPERIENCE IN THE AMATEUR RADIO AND COMMUNICATIONS SERVICE INDUSTRY PROVIDES US WITH THE BACKGROUND AND KNOWHOW TO OFFER YOU THE BEST IN SERVICING

CO AXIAL CABLE

RG 58/U	5.6dB/100 ft. at 100MHz	$0.45/m
5D FB	2dB/100 ft. at 100MHz	$1.20/m
PL-259	Connectors to suit 5d/FB/RG-58	$1.10 ea.
SO-239	Sockets	$1.10 ea.

FS-302 - $58
50 170MHz

VS-1

THE ANSWER TO THE NOVICE'S DREAM AT A NOVICE'S PRICE

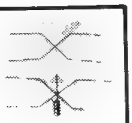
FT-7

FEATURES:
Modern compact styling for easy under-dash mounting.
Size 230mm x 80mm x 290mm.
80 to 10 metre operation.
VFO controlled.
Noise Blanker that really works.
Facilities for fixed channel operation.
Ideal for the shack or the mobile at a price that you can afford.
Only $548 including mobile mount, microphone and cables.

SWR-200 Osker Block

HIDAKA MODEL VS-22
10 and 15 metre Duo-band
3 element yagi. **Our price $172**

SWISS QUADS



Offer high forward gain (up to 14dB) narrow beam width and good front to back ratio.

SQ-20M	–	20MX Swiss Quad	$265
SQ-15		14MX Swiss Quad	$146
SQ-10	–	10MX Swiss Quad	– $135

NEW PRODUCTS:

BL-1A 5KW PEP 1.8 – 40 MHz, 1:1 Toroidal Balun. 50 75 Ohms
Less 0.1 dB insertion loss. **Price: $15.99**

A-248D 80/40/20 metre Trapped Dipole Antenna Complete with Wire, Insulators, and Traps. 18 metres long. 2 KW PEP rating.
Price: $36.00

HEAVY DUTY HF HELICAL WHIPS, 80—10 mx.
ONLY $29.00 each.

20 Foot Tower Self Supporting **Price: $75.00**

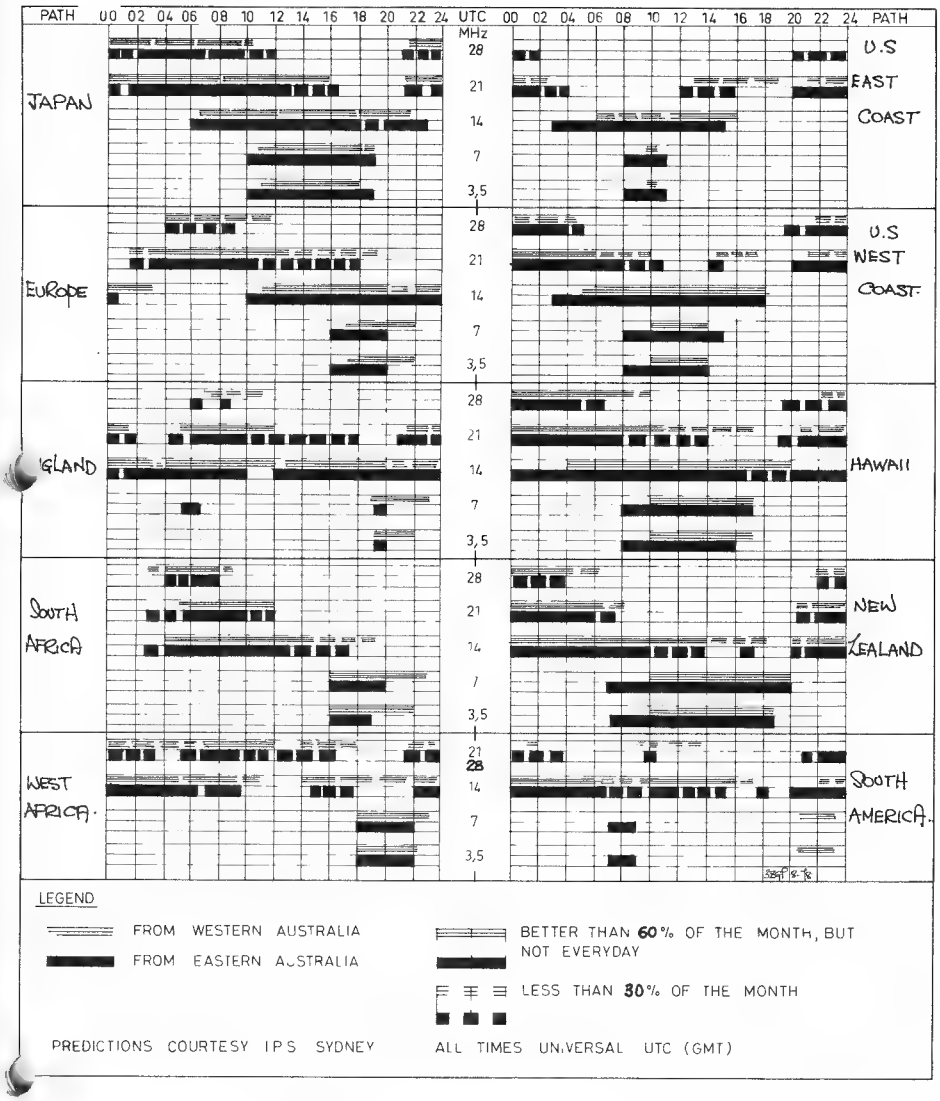
ALL OUR EQUIPMENT IS PRE-SALES CHECKED AND WHERE AC MAINS OPERATED THEY ARE WIRED WITH 3 CORE POWER CABLES AND PLUGS. Prices include Sales Tax

90 DAY LIMITED WARRANTY TO ALL EQUIPMENT BUT DOES NOT COVER FINAL TUBES OR SEMI-CONDUCTORS. PRICES AND SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE.

G.F.S. ELECTRONIC IMPORTS 15 McKEON ROAD, MITCHAM, 3132. (03) 873 3939

IONOSPHERIC PREDICTIONS

Len Poynter VK3ZGP/NAC



QSP

AR ADDRESS LABELS

Your AR address label can convey much information to you. If any of it is incorrect write in at once to have it corrected, preferably write to the Execuive office for changes in name, address and call sign and to your Division for other changes.

Firstly, are your name, initials, title, address, post code and call sign correct? If there is an error write in at once to have it corrected. If your letter reaches the Executive office before the middle of the month the correction will appear in next month's AR label. If, as often occurs, your letter is received later than mid-month, you will have to wait for one further month's AR label for the correction. The computer input goes in once a month shortly after mid-month.

Secondly, the coding which forms the fourth line of the label details. The first character is alphabetical to signify your grade. The various grades and subscriptions applicable to those grades usually appear in AR for December or January each year. The second character is a digit indicating the Division to which you belong, e.g., "4" represents VK4, etc. The next two are 00 digits indicating your subscription is due in December/January. The next is a single digit, being a distribution code for mailing purposes. The figure "1" is for continental Australia designated by post codes, the figure "2" for New Zealand mailings, the figure "6" for overseas air mail, etc. The postal regulations for Category "B" publications require that each AR for a particular post code must be mailed in one lot with all the other articles in that post code, and further, that certain groups of post code articles must be bundled together at the time of posting. The final two digits preceding the call sign are zone identification digits which, at present, will only come into use for Tasmanian addresses.

The call sign on your address label is the one which will go into the next call book. If you hold two call signs please send in the details if you have not already done so.

PENSIONERS

Members are reminded that only the Division can decide who of its members may or may not qualify for the lower concessional pensioner rate. Do not wait until you receive a subscription notice before deciding to claim a pensioner rate. Do it well in advance because you must allow time for various delays. It is better to do it now rather than have your AR cut off because of being unfinancial. Remember, if you wish to apply for pensioner grading do it now and send copies of your papers direct to your Division. ■

PROGRAMMES SPECIFICALLY FOR DXERS AND KEEN SHORTWAVE LISTENERS

SPAIN:
"DX Programme", Saturdays 2220-2225.

WEST GERMANY:
"DXer's desk", Saturdays 1730 GMT. Other DX programmes are transmitted by the "Voice of Germany".

JAPAN:
"Tokyo Calling" (DX news and programme guide), Sundays 10000.

ECUADOR:
"DX Partyline" with Helen and Clayton Howard, Mondays, Thursdays and Saturdays at 0900. A different half hour each day!

NEW ZEALAND:
"Arthur Cushen's DX World", on the First Sunday of each month at 1015 GMT; "Mailbox" on the 3rd Sunday of each month also at 1015 GMT (during the day-light saving months, these programmes are transmitted one hour earlier — 0915 GMT).

BRITAIN:
"World Radio Club", Wednesdays at 0815, 1330 and 2315, and on Fridays at 2100 (Saturday morning in Australia).

HOLLAND:
"DX Jukebox", Thursdays approx. 15 minutes after the start of each broadcast. It's a weekly session for shortwave listtners and DXers the world over. First Thursdays: SW propagation predictions by Maarten van Delft and Arthur Cushen's Pacific Report. Other Thursdays: regional DX reports from Jan Tuner (Sweden); Glenn Hauser (USA); and Victor Goonetilleke (Sri Lanka). Also technical mailbag in each programme. Ask for the free DX Information Service Catalogue. Technical Information by Wim van Amstel. Produced and presented by Dick Speekman. The address: "DX Jukebox", Radio Nederlands, PO Box 222, Hilversum, Holland.

SOUTH AFRICA:
"DX Corner" with Gerry Wood; Wednesdays and Saturdays during the last half-hour of the transmission.

SWEDEN:
"Sweden Calling DXers", the 30-year old programme from Stockholm is a must for the active DXer. Each Tuesday, 15 minutes is devoted to the programme. Also host George Wood will be presenting "Shortwave Corner", every Thursday during June, July and August, featuring different facets of radio, especially in Sweden.

AUSTRALIA:
"Club Forum" is the DXers programme on our own international service. Each Saturday the programme is repeated several times at 0240, 0840 and 1440. The programme is aired at 8 am Melbourne time on 6150 (7.30 am in South Australia). Also featured on the programme are the latest tips in the "DXers Calling" segment.

AUSTRIA:
"Austrian Shortwave Panorama" is aired each Sunday at 0300 and 0915.

SWITZERLAND:
"Swiss Shortwave Merry-go-round" is aired on Saturdays but only on the Second and Fourth Saturdays. Bob Thomann and Bob Zanotti will keep you up-to-date on international radio around the world. Why not ask a technical question?

CANADA:
"DX Digest" with host Ian McFarlane host the programme transmitted on Sundays.

Check the World Radio and TV Handbook for further information.

Information from "DX Post", June 1978, the publication of the Southern Cross DX Club. ■

CONTESTS

VK/ZL/OCEANIA DX CONTEST 1978 — RULES

NZART and WIA, the national amateur radio associations in New Zealand and Australia, invite worldwide participation in this year's VK/ZL/Oceania DX Contest.

WHEN?

Phone — 24 hours from 1000 GMT, Saturday, 7 October to 1000 GMT, Sunday, 8 October.

RTTY — Same times as for phone.

CW — 24 hours from 1000 GMT, Saturday, 14 October to 1000 GMT, Sunday, 15 October.

RULES

1. There shall be five main sections in the contest —

(a) Transmitting Phone, Open.

(b) Transmitting CW, Open.

(c) Receiving — "Phone & CW" combined.
For VK and ZL only — QRP Sections, 5 watts Argonaut rating.

(d) Transmitting Phone — QRP.

(e) Transmitting CW — QRP.

2. The Contest is open to all licensed transmitting stations in any part of the world. No prior entry need be made. Mobile marine and other non-land based stations are permitted to enter. Their "country status" will be determined by the country which issued the callsign used in the contest.

3. All amateur bands may be used but no cross band operation is permitted. NOTE: VK and ZL stations irrespective of their location DO NOT contact each other for contest purposes EXCEPT on 80 and 160 metres on which bands contacts between VK and ZL stations are encouraged.

4. Phone will be used during the first weekend and CW during the second weekend. Stations entering both section must submit separate logs.

5. Only one contact on CW and one contact on phone per band is permitted with any one stataion for scoring purposes.

6. Only one licensed amateur is permitted to operate any one station under the owner's callsign. Should two or more operate any particular station, each will be considered a competitor and must submit a separate log under his own callsign. This is not applicable to overseas competitors operating club stations.

7. Entrants must operate within the terms of their licences.

8. CYPHERS: Before points can be claimed for a contact, serial numbers must be exchanged and ACKNOWLEDGED. The serial number of five or six figures will be made up of the RS (phone) or RST (CW) report plus three figures which may begin with any number between 001 and 100 for the first contact and which will increase in value by one for each successive contact, e.g. if the number chosen for the first contact is 021, then the second must be 022 followed by 023, 024, etc. After reaching 999, restart from 001.

9. SCORING: (a) For Oceania stations other than VK/ZL — 2 points for each contact on a specific band with VK/ZL stations and 1 point for each contact on a specific band with the rest of the world.

(b) For the rest of the world other than VK/ZL — 2 points for each contact on a specific band with VK/ZL stations and 1 point for each contact on a specific band with Oceania stations other than VK/ZL.

(c) For VK/ZL stations: Points for each QSO on different bands as follows: 20m — 1 point, 15m — 2 points, 10m — 3 points, 40m — 4 points, 80m — 5 points, 160m — 5 points. Score for EACH BAND will be the total points score for that band multiplied by the total prefixes worked. NOTE: W1, K1, WA1, WN1, A1, N1 (although all in the same call area) are different prefixes and count as multipliers. W6AA/1 is same as above and counts as a "W1" and not "W6".

(d) 80 metre section: For 80 metre contacts between VK and ZL stations, each VK and ZL call area will be considered a "scoring area" with each contact counting five points. Each different call area will count as a multiplier.

(e) 160 metre Section: Contacts permissible between VK/ZL, VK/VK, ZL/ZL, as well as VK/ZL to the rest of the world. Each VK and ZL call area will count as a "scoring area" with each contact counting five points. Each different call area will count as a multiplier. NOTE: A contestant may claim points for contacts with other stations in the SAME call area for his 160 metre section.

10. LOGS:
(a) Overseas Stations: (a) Logs to show in this order — date, time in GMT, callsign of station contacted, band, serial number sent, serial number received. UNDERLINE each new VK/ZL call area contacted. Separate log must be submitted for each band used.

(b) Summary sheet to show — callsign, name and address in BLOCK LETTERS, details of equipment used; and, for EACH BAND — QSO points for that band — VK/ZL call areas worked on that band. "SINGLE BAND" score will be QSO points for that band multiplied by total VK/ZL call areas worked on that band. "ALL BAND" score will be total QSO points for all bands multiplied by total VK/ZL call areas worked on all bands.

(b) VK/ZL STATIONS: (a) Logs must show in this order — date, time in GMT, callsign of station worked, band, serial number sent, serial number received. USE SEPARATE LOG FOR EACH BAND.

(b) Summary sheet to show — name and address in block letters; callsign; for EACH BAND — QSO points for that band, prefixes worked on that band, claimed score for that band. "All Band" score will be total of single band scores. Give details of equipment used and declaration that all rules and regulations have been observed.

11. The right is reserved to disqualify any entrant who, during the contest, has not strictly observed regulations or who has consistently departed from the accepted code of operating ethics.

12. The ruling of the Executive Council NZART will be final.

13. AWARDS: Separate awards for phone and for CW.

WORLD-WIDE EXCEPT VK/ZL

(a) Attractive multi-colour certificates to the top scorers in each country (call areas in "W", "J", "U".

(b) Depending on reasonable degree of activity, separate awards may be made for top scorers on different bands.

(c) Where many logs are received, consideration will be given to awarding second and third place certificates.

TO VK AND ZL STATIONS

OPEN SECTION — CERTIFICATES —

(a) To top three scorers in each call area VK/ZL.

(b) To top three scorers on individual bands — (160, 80, 40, 20, 15, 10) in VK and in ZL.

QRP SECTION —

(a) Top three scorers in VK and in ZL.

(b) Others depending on activity.

14. ENTRIES FROM VK/ZL STATIONS should be posted direct to —

NZART Contest Manager ZL2GX,
152 Lytton Road,
Gisborne, New Zealand.

To arrive before 31 December, 1979.

ENTRIES FROM OVERSEAS STATIONS — posted to the above address or the Headquarters, Box 1459, Christchurch to arrive not later than 31 January, 1979.

SWL SECTION

1. The rules are similar to the transmitting section but it is open to all members of any SWL society in the world. No transmitting station is permitted to enter this section.

2. The contest times and logging of stations on each band per weekend are as for the transmitting section except that the same station may be logged twice on any band — ONCE ON PHONE AND ONCE ON CW.

3. To count for points, the station heard must be in QSO exchanging cyphers in the VK/ZL/Oceania DX Contest and the following details noted — date, time in GMT, call of the station heard, call of the station he is working, RS(T) of the station heard, serial number SENT by the station heard, band, points claimed.

4. Scoring is on the same basis as for the transmitting section and a summary sheet should be similarly set out.

5. Overseas stations may log ONLY VK/ZL stations but VK receiving stations may log overseas stations and ZL stations, while ZL receiving stations may log overseas stations and VK stations.

6. Certificates will be awarded as listed in the section under Awards.

RTTY SECTION RULES

WHEN
7th to the 8th October. (The same week-end as the VK/ZL Phone section of the contest.)

TIME
10.00 GMT Saturday to 10.00 GMT Sunday.

BANDS
All amateur bands 3.5 MHz to 28 MHz.

CLASSES
Single operator, multi operator, SWL operator. Logs of multi operator stations must be signed by all the operators, together with their call signs. Logs of SWLs must contain both number sent and the number received by the station logged. Incomplete loggings are not eligible for scoring.

NUMBER EXCHANGE
Number will consist of RST, Zone Number and time in GMT.

SCORING
As per CARTG Zone Chart, multiplied by the number of countries worked, multiplied by the number of continents worked (maximum six). World stations add 100 points for each VK and ZL station worked after the above calculations.

Example: 720 points from zone chart x countries worked x 5 continents worked, equals 90,000 points, plus six (6) VK/ZL stations worked (that is 600 points), giving a total of 90,600 points. A station may be worked only once on each band, but may be worked on another band for further multipliers.

COUNTRIES
Country count as per ARRL list of countries, plus each VK/ZL, JA, and W/K districts count as separate countries. Contact with one's own country count zero points for multipliers.

LOGS
Logs must show in this order: Date, Time (in GMT), Call Sign of station worked, Serial number received, Serial number sent and points claimed.

CLOSING DATE
Logs must be received by the contest committee by the 1st January 1979. The address for the RTTY Section of the VK/ZL/OCEANIA DX Contest is S. E. Molen, 13 Pendle Way, Pendle Hill, 2145, Sydney, NSW, Australia.

SUMMARY SHEET
Summary sheet must show call sign of station, name of operator/s and address of same, bands used. (A separate log is required for each band.) The points claimed for each band, number of VK/ZL stations worked, total points claimed and signature/s.

Multi operator stations' logs must contain the signature and call sign of each operator.

AWARDS
Certificates will be issued for 1st, 2nd and 3rd place on a world basis, and 1st, 2nd and 3rd place on a country basis.

The judges' decision with regard to the placings in the contest will be final and no correspondence will be entered into with regard to same. The logs become the property of the contest committee on completion of checking. ■

EXCHANGE POINTS TABLE

YOUR zone \ CORRESPONDENT zone	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1	2	14	10	13	16	18	22	20	25	30	36	37	39	21	22	19	20	17	11	25	29	29	22	22	16	28	25	31	39	35	14	36	25	29	34	39	40	47	44	15
2	14	2	15	8	7	16	16	12	16	23	24	30	30	12	14	16	19	20	19	19	25	31	26	30	28	35	35	40	50	50	25	47	14	21	21	28	33	36	37	6
3	10	15	2	8	11	9	13	14	18	21	28	28	30	26	28	27	29	27	21	32	37	39	32	31	24	37	33	40	43	35	11	32	29	35	35	42	48	50	52	20
4	13	8	8	2	3	8	10	8	12	18	22	25	27	19	21	23	26	26	22	26	33	37	32	34	30	40	38	44	52	44	20	40	21	28	26	33	40	41	44	14
5	15	7	11	3	2	9	9	6	10	17	20	24	25	18	20	22	26	26	24	35	32	38	33	35	31	41	40	45	54	46	22	41	19	27	24	31	38	39	42	13
6	18	16	9	8	9	2	4	7	10	12	19	19	21	27	29	31	34	33	29	34	40	46	40	40	33	46	42	49	47	38	17	32	28	36	30	37	44	43	48	22
7	22	16	13	10	9	4	2	4	6	8	15	15	17	26	29	31	35	36	33	33	40	47	42	44	38	50	46	53	49	40	22	34	26	34	26	33	40	38	44	22
8	20	12	14	8	6	7	4	2	5	11	15	18	19	22	24	27	31	32	30	29	35	42	38	42	37	47	46	51	54	44	24	38	21	30	23	30	38	36	41	13
9	25	16	18	12	10	10	6	5	2	8	10	14	15	23	25	29	33	35	34	29	35	43	41	45	41	50	50	55	52	45	28	38	21	30	20	27	35	32	38	21
10	30	23	21	18	17	12	8	11	8	2	9	7	9	31	33	37	41	43	41	36	42	51	49	52	45	58	52	54	44	37	28	31	28	36	24	29	38	31	38	29
11	36	24	28	22	20	19	15	15	10	9	2	9	7	26	28	33	36	41	43	30	34	42	45	51	52	49	55	49	42	41	37	35	22	29	16	20	28	23	29	27
12	37	30	28	25	24	19	15	18	14	7	9	2	3	35	37	41	45	49	48	39	42	49	53	58	50	52	52	48	37	33	32	27	31	37	34	27	33	27	33	34
13	39	30	30	27	25	21	17	19	15	9	7	3	2	33	35	40	43	48	49	37	39	46	50	56	53	50	52	46	34	34	35	29	29	34	21	24	30	24	30	34
14	21	12	26	19	18	27	26	22	23	31	26	35	33	2	3	6	10	14	18	7	14	21	19	25	27	27	30	32	42	49	34	55	5	10	15	19	21	26	26	6
15	22	14	28	21	20	29	29	24	25	33	28	37	35	3	2	5	9	13	18	6	11	18	17	23	27	25	29	30	39	47	36	54	6	7	15	18	19	25	24	8
16	19	16	17	23	22	31	31	27	29	37	33	41	40	6	5	2	4	8	13	6	10	15	12	18	22	21	24	26	36	42	33	49	10	9	20	21	21	27	25	9
17	20	19	29	26	26	34	35	31	33	41	36	45	43	10	9	4	2	5	12	7	8	12	8	14	19	17	20	22	32	38	32	45	14	10	22	22	20	27	23	12
18	17	20	27	26	26	33	36	32	35	43	41	49	48	14	13	8	5	2	7	12	12	12	6	11	14	15	16	20	30	35	29	40	13	15	27	28	24	31	27	14
19	11	19	21	22	24	29	33	30	34	41	43	48	49	18	18	13	12	7	2	18	19	16	10	10	9	16	15	20	30	32	21	36	23	21	33	34	30	38	33	16
20	25	19	32	26	35	34	33	29	29	26	30	39	37	7	6	6	7	12	18	2	6	14	14	20	26	21	26	25	34	43	39	49	8	3	15	16	15	22	20	12
21	29	25	37	33	32	40	40	35	35	42	34	42	39	14	11	10	8	12	19	6	2	9	11	17	24	16	21	20	28	37	40	43	14	6	18	16	11	19	15	19
22	29	31	39	37	38	47	46	42	43	51	42	49	46	21	18	15	12	12	16	14	9	2	6	10	18	17	13	11	21	29	36	35	22	14	26	22	15	22	16	24
23	22	26	32	32	33	40	42	38	41	49	45	53	50	19	17	12	8	6	10	14	11	6	2	6	13	8	12	14	24	30	31	37	22	16	29	26	21	28	22	20
24	22	30	31	34	35	40	44	42	45	52	51	58	56	25	23	18	14	11	10	20	17	10	6	2	8	6	6	10	20	24	26	30	28	22	35	33	25	32	25	25
25	16	28	24	30	31	33	38	37	41	45	52	50	53	27	27	22	19	14	9	26	24	18	13	8	2	13	9	15	23	30	18	27	32	28	41	40	33	40	33	25
26	28	35	37	40	41	46	50	47	50	50	49	52	50	27	25	21	17	15	16	21	16	7	8	6	13	2	6	5	16	22	31	29	29	21	33	29	21	27	20	29
27	25	35	33	38	40	42	46	46	50	52	55	52	52	30	29	24	20	16	15	26	21	13	12	6	9	6	2	7	15	18	25	25	34	27	40	35	27	32	26	30
28	31	40	40	44	45	49	53	51	55	54	49	48	46	32	30	26	22	20	20	25	20	11	14	10	15	5	7	2	10	17	31	24	34	25	36	30	22	26	19	34
29	39	50	43	52	54	47	49	54	52	44	42	37	37	42	39	36	32	30	30	34	28	21	24	20	23	16	15	10	2	9	15	32	42	33	39	31	24	24	20	44
30	35	50	35	44	46	38	40	44	45	37	41	33	34	49	47	42	38	45	32	43	37	29	30	24	30	22	18	17	9	2	24	7	51	42	47	40	33	32	29	48
31	14	25	11	20	22	17	22	24	28	28	37	32	35	34	36	33	32	29	21	39	40	36	31	26	19	31	25	31	15	24	2	22	39	42	46	53	52	56	51	28
32	36	47	32	40	41	32	34	38	38	31	35	27	29	55	54	49	45	40	36	49	43	35	37	30	27	29	25	24	32	7	22	2	57	48	47	42	38	34	33	50
33	25	14	29	21	19	28	26	21	21	28	22	31	29	5	5	10	14	18	23	8	14	22	22	28	32	29	34	34	42	51	39	57	2	9	10	14	18	22	23	10
34	29	21	35	28	27	36	34	30	30	36	29	37	34	10	7	9	10	15	21	3	6	14	16	22	28	21	27	25	33	42	42	18	9	2	13	12	12	18	16	16
35	34	21	35	26	24	30	26	23	20	24	16	34	21	15	15	20	22	27	33	15	18	26	29	35	41	33	40	36	39	47	46	47	10	13	4	7	15	15	19	20
36	39	28	42	33	31	37	33	30	27	29	20	27	24	19	18	21	22	28	34	16	16	22	26	33	40	29	35	30	31	40	53	42	14	12	7	2	8	8	11	24
37	40	33	48	40	38	44	40	38	35	38	28	33	30	21	19	21	20	24	30	15	11	15	21	25	33	21	27	22	24	33	52	38	18	12	15	8	2	7	5	28
38	47	36	50	41	39	43	38	36	32	31	23	27	24	26	25	27	27	31	38	22	19	22	28	32	40	27	32	26	24	32	56	34	22	18	15	8	7	2	6	32
39	44	37	52	44	42	48	44	41	38	38	29	33	30	26	24	25	23	27	33	20	15	16	22	25	33	20	26	19	20	29	51	33	23	16	19	11	5	6	2	32
40	15	5	20	14	13	22	22	18	21	29	27	34	34	6	8	9	12	14	16	12	19	24	20	25	25	29	30	34	44	48	28	50	10	16	20	24	28	32	32	2

RTTY SCORING CHART.

Confirmation has been received from the WIA NSW Division that the Federal Contest Manager is Mr. Wally Watkins VK2ZNW henceforward.

Wally will be assisted by a small committee of Club members. Best wishes are conveyed for the ensuing nominal 3 year period.

Members please note in your log or other convenient place the address for future contests matters. This is —

Federal Contest Manager
Orange and District Amateur Radio Society
Box 1065
Orange, NSW 2800.

The Federal Contest Manager is involved with the Remembrance Day Contest, Ross Hull Memorial VHF Contest, John Moyle Memorial National Field Day Contest and Contests Champion Trophy. The VK/ZL/0 Contest is managed separately by Mr. N. R. Penfold VK6NE, 388 Huntriss Road, Woodlands, WA 6018 (alternating with NZART) and the RTTY part of the VK/ZL/0 Contest by the WIA NSW RTTY Group, C/o 14 Atcheson Street, Crows Nest, NSW 2065. ■

INTRUDER WATCH

Alf Chandler, VK3LC

INTRUDER WATCH

It has recently been reported that Japanese fishing boats have been operating in the 1.8 MHz band.

Apparently the Japanese administration has been doing its homework lately and taken them from the 3.5 MHz band, because the following regulations apply:—

ITU allocations are as hereunder stated —

In Region 3 (that is, the Pacific area) 3500-3900 kc/s are allocated to the Amateur, Fixed, Mobile Services, but a footnote specifies — "In Australia, the band 3500-3700 kc/s is allocated to the Amateur Service; the band 3700-3900 kc/s is allocated to the Fixed and Mobile Services".

Also, ITU regulations state in all Regions — "The band 1800-2000 kc/s is allocated to the Amateur, Fixed, Mobile except aeronautical, Radio navigation".

Thus, Japanese fishing boats operating in the 1.8 MHz band are perfectly legal and, although a nuisance there, nothing can be done to move them.

We are very appreciative of reports which alert us of the phenomena. However, further reports are not necessary.

We would appreciate reports on all other intruders, and I am pleased to note that these reports are starting to be more prevalent.

Keep it up! ■

WICEN

PARKES WICEN EXERCISE, 24-25 MARCH

This exercise was to provide communications for a car rally held at night over a total distance of 1,100 kilometres.

FRIDAY, 24 MARCH

Cars left Parkes at 1800 hours and moved off into sparsely populated area to the west. The frequency used was 3.5 MHz and conditions on this band were excellent. The checking of cars in and out of each section and the reporting of lost or damaged cars reduced the work of the rally officials to a minimum. Mobile 80 metre stations, complete with generators, etc., were erected and dismantled and then re-erected at the next control in fine order. The location of some controls was not known until about 40 minutes before we were required, but all stations opened on time. The Novice operators performed very well, but did lack WICEN experience. The lack of correct message forms also inhibited procedure. The net closed at 0430 on Saturday.

SATURDAY, 25 MARCH

Same operators as on previous day and all stations opened on time. Conditions on 80 metres were awful!!! At times CW was the only mode which could be used. However, every message got through, and without any errors (including some police traffic). The final leg of the rally was not covered due to the lateness of some cars in clearing the first section. Weather conditions very bad also. Much of the second day traffic would have been better worked on VHF as distances were much shorter and within range of the repeater. The net closed at 2400 hours.

The exercise tested all those involved in setting up stations in a hurry and operating portable at night and in poor weather.

The control station was VK2BPK — Parkes club station, and the operators involved at the control station and in the field were: Jack VK2BMJ, Brian VK2NNS, David VK2NNC, Tom Darcy VK2N--, Kim VK2ASY, Ron VK2NQV, Peter VK2NIQ.

QANTASTIC MOTORCYCLE TRIAL

WICEN was asked to provide radio links between Towac Park HQ and the control points for the Qantastic Two Day Motorcycle Trial over the long week-end in June. The links were to relay information from controls to HQ to assist in the tabulation of scores and to provide other communications as required between control captains and officials at Towac Park.

Preliminary tests confirmed that the net could be established using low power FM and SSB 2 metre equipment. About 20 amateurs (including some from Sydney) took part. Communications to all stations was excellent on both days and the reliability of the information sent back to Towac Park was of great assistance for scoring and for determining the locations of "lost" riders.

The exercise was organised by Orange WICEN co-ordinator, Wally VK2ZNW. ■

VHF-UHF
AN EXPANDING WORLD

Eric Jamieson, VK5LP
Forreston. 5233

AMATEUR BAND BEACONS

VK1	VK1RTA, Canberra	144.475
VK2	VK2WI, Sydney	52.450
	VK2WI, Sydney	144.010
	VK2RHR, Mittagong	144.120
VK3	VK3RTG, Vermont	144.700
VK4	VK4RTL, Townsville	52.440
	VK3RTT, Mt. Mowbullan	144.400
	VK4RBB, Brisbane	432.400
VK5	VK5VF, Mount Lofty	53.00
	VK5VF, Mount Lofty	144.800
VK6	VK6RTV, Perth	52.300
	VK6RTU, Kalgoorlie	52.350
	VK6RTW, Albany	52.950
	VK6RTW, Albany	144.500
	VK6RTV, Perth	145.000
VK7	VK7RNT, Launceston	52.400
	VK7RTX, Ulverstone	144.900
	VK7RTW, Ulverstone	432.475
VK8	VK8VF, Darwin	52.200
JA	JA2IGY, Nagoya	52.500
KG6	KG6JDX, Guam	50.110
KH6	KH6EQI, Hawaii *	50.104
TI	TI2NA, Costa Rica	50.080
W	WA6JRA, Los Angeles, USA	50.091
ZL1	ZL1VHF, Auckland	145.100
	ZL1VHW, Waikato	145.150
ZL2	ZL2VHP, Palmerston North	52.500
	ZL2VHF, Wellington	145 200
	ZL2VHP, Palmerston North	145.250
ZL3	ZL3VHF, Christchurch	145.300
ZL4	ZL4VHF, Dunedin	145.400

* The VKOMA beacon has been deleted from listing. There seems no evidence to support that it is operating — perhaps the quickest way to find out for sure will be to remove it.

The frequency of the KH6EQI beacon is relisted as 50.105 MHz, and the calling frequency is 50.110. Confirmation of this comes from Ross VK4RO, who also worked KH6JSI and WA8GUB/KH6 on 27-5-78 between 0737 and 0930Z. Ross has also indicated a listing of his six metre activities will be sent when the 6 metre season finishes! Ross, it may never finish in your area, at least maybe not for several years anyway!

P29 NEWS

George P29HV sent along the last issue (March) of "Garamut", the newsletter of the PNG Amateur Radio Society. Included in this is news of net operations on Tuesdays on 14170 kHz at 1930Z and 3620 kHz at 1000Z, with the HF calling frequency being on 7050 kHz on Saturdays and Sundays. So if you want to raise P29 for a VHF contact try one of the above!

George further reports the first P29 to VK4 Es contact on 146 MHz on 22-1-78 has now been confirmed as being between VK4ZSH and P29ZWW. On 4-2-78 PNG changed over from Channel 40 as calling frequency to Channel 50. On 20-5-78 P29~~RPM~~ Port Moresby became an operational working repeater on Channel 8, and so far has been working well.

Also forwarded to me is a copy of a letter sent to all PNG amateurs from their Administration on the subject of "Changes to Licensing Condition", viz.:

"1. From 5th May, 1978, all Novice Amateur Operators will be permitted to operate VFO (Variable Frequency Oscillator) control of their transmitters within the Novice Bands, which are: 3.525-3.575 MHz; 21.125-21.200 MHz; 28.100-28.600 MHz.

"2. From 5th May, 1978, all Full and Limited Amateur Operators will be permitted to operate between 50 MHz to 54 MHz within the 6 metre band. This temporary extension applies until further notice." Oh, well! To live in some areas has its advantages it seems, and the PNG boys have not been slow in making use of their extended allocation as the following extracts from the P29HV log indicates.

"1-5-78: JA1, 2, 3, 4, 5, 6, KG6, KH6EQI, plus East Malaysia, Hawaiian, Chinese and Korean TV. 3-5: JA1, 2, and KH6EQI, plus above TV reception. 6-5: KH6JSI, WA8GUB/KH6, KH6HI, KH6EQI beacon, JA1, 2, 3, 5, 7 and 0, plus Malaysia, Hawaii, China and Japanese Ch. 3 TV at 2020Z on 107 MHz. 8-5: KH6EQI, HL9, JA1, 2, 3, 4, 5, 7, 8 and 0, plus TV from Hawaii, Malaysia, China and Korea. 10-5: KG6, KH6EQI beacon, JA2 and 6, plus Chinese TV. 12-5: ZL Ch. 1 TV, 2045-2145Z, mixed (2 or 3 channels). 13-5: ZL Ch. 1 TV, 1415 to 1430Z, and KH6EQI, 2007 to 2100Z. 15-5: KH6EQI beacon, JA1, 2, 3, 7 and 8, plus 8J9ITU Toyama special station at 2005Z, plus Hawaiian and Chinese TV.

"16-5: KH6EQI, JA1, 2, 3, 4, 5, 7, 9 and 0, plus KG6JDX and Chinese TV. 17-5: JA1, 2, 4, 5 and 7, plus Russian and Chinese TV. 18-5: KH6EQI, JA1, 2 and 7. 20-5: KH6EQI, JA6, plus Hawaiian TV. 21-5: JA1 and 7, Chinese and Korean TV. 23-5: Channel 4 and 6 in colour from Mackay, Qld., but no amateur signals. 24-5: KH6EQI, Hawaiian TV, plus JAs. 25-5: JA1, 7 and 0, Russian and Korean TV. 28-5: KH6EQI, and HLKA on 49.3 MHz, plus Russian and East Malaysian TV. 29-5: KH6EQI, KH6JSI and JR1. 31-5: Chinese TV test pattern and school programme on R1." And so it goes on. If this is the type of reception possible at present what is it surely going to be during the next two years! . . . 5LP.

SIX METRES

This does seem to be the band with the greatest continuing interest. I have received another letter from Graham VK8GB in Darwin with the happenings in that area. Readers may care to compare notes between P29HV and VK8GB, so here is the listing from Graham.

"18-5: 1105Z KG6JIH. 19-5: 1015Z JH2VHL, 1023Z JA9OMU. 22-5: 1112 to 1212Z JA1, 2, 3, 4, 5, 6, 7 and 0. 26-5: 1117 to 1420Z JA1, 2, 3, 4, 7, 8, 9 and 0 for 40 contacts, plus HL9WI. The contact with JE1CCD in Yamanshi was the last prefecture required to give WAJD on six metres. 27-5: 1033 to 1110Z JA6 YAP, JH6YDN, JA8EIA, JA8RRD, KG6JIH and KG6DX. 28-5: 1140 to 1203Z JA4HPU, JF3DWO, JH6TEW and JH1WHS. 29-5: 1120Z KG6JIH, 1125Z KG6JDX.

"2-6: 1130 to 1150Z KG6JIH, JA2DON, JH6TEW and JA2BZY. 3-6: KG6JIH, KG6DX, JA1 and 2 for 6 contacts. 4-6: 1055 to 1157Z KG6DX, KG6JIH, JA1, 2, 3 and 6 for 6 contacts. 7-6: 0945Z JF3AKI. 18-6: 1110Z KG6DX, 1120Z KG6JIH, 1132Z JH6TEW and 1200Z JR1AUW."

Readers will note that when lists of districts worked are mentioned without actual call signs, this numbering of JA1 to 5, etc., really means 1 to 5 call areas, the actual prefixes could be JA1, JH1, JE1, JR1, etc. etc.

Graham goes on to say that he hears TV signals on 49.75 $\pm$ .010 nearly every day and JA signals on the low end every second day on the average. Weak signals on two metres coinciding with six metre JA openings but no contacts.

"I (Graham) spoke to KL7FBI on 15 metres on 26-5. The operator is Mike Celmer, Box 643, APO 98736, Seattle, USA. KL7FBI is a military club station on Shemya Is. and WA4TNV/KL7 operates out of the shack on six metres. They have a dual 6 metre rhombic with 26 dB gain pointed at JA. I'm not sure of their equipment otherwise, but they suggested that because of the antenna direction VK contacts may be very difficult.

"HL9WI advises he is running skeds with LU3EX on 50.104 210 to 2230Z, 0030 to 0345Z daily, and 0900 to 1400Z every week-end. Apparently Alfred LU3EX holds the world record for six with a contact to JA6FR on 24-3-56. A contact HL9 to LU3 would break this record. Bill HL9WI also advises that W technicians have all VHF privileges now and that WA6JRA beacon is on 50.085. The ARRL beacon segment is now 50.070 to 50.080. VP2LAW has 36 countries confirmed on six!

The following information also came from Graham VK8GB and originated from JR1AVW: "7-6-78: UAO worked JA6 on 144 MHz Es. 11-6: UAO to JA3, 4 and 6 on 144 Es. Also JA6 to JA8 on 144 Es. Also heard W6XJ, K6MYC, K6MEP, WA7BJU, N6NR, W6TVZ, K6AUQ and K6HPC between 2200 and 2240Z. JR1AVW same date worked KH6XX and VS6FX (both new stations), KH6EQI, VS6BE, HLGWI, HL9TG and HM2HS. 12-6: HM2 and P29ZDU. 13-6: Worked WA7BJU, WA7AEV 0520-0650Z. 14-6: KH6XX, KG6, P29 and JD1. 15-6: KH6XX, KH6IAA, JD1, KG6 and P29. 16-6: KH6EQI. 0455 to 0540Z worked WA6MMJ, WA7BJU, K7TUO, K7KV, WB6NMT and K6HCP. 18-6: KH6XX and heard KH6 working W via Es.

"The details of KH6EQI beacon are that it is definitely on 50.104 zero beat (1 kHz tone on 50.103). Bert KH6HI can key the beacon and listen from his own QTH on 50.104. On establishing contact he will ask stations to QSY to 50.110 and then continue the contact from his own gear and set the beacon running again.

"The P29s are finding their newly allocated 2 MHz from 50 to 52 MHz a great advantage, and making full use of it. On two metres three teletype stations on 146.780, 146.800 and 146.810 MHz are good beacons into JA." Thanks again, Graham, for your news and information, it makes good reading. . . . 5LP.

SPORADIC "E"

John Allan VK5UL sends a page from "Wireless World" April 1978, headed "Mysteries of Sporadic E". As this is something which has no doubt intrigued most VHF operators for a long time, I feel it is worth printing for your interest, and I thank you, John, for your kindness in sending it along.

"Pat Hawker wrote in your February issue about the mysterious Sporadic E. Readers might like to know what has been learned, from a combination of ground-based and rocket observations.

"Sporadic E was first seen to occur in the way it does, that is, as very thin intense layers of ionisation, by a British Skylark rocket flown from Woomera in 1958. By 1966 an association between these layers and sharp reversals in wind direction at high altitude had become recognized. Wind measurements in the very rarified atmosphere up to 150 km or so revealed that a surprising pattern of wind reversals with height can occur; what is more, the measurements showed that the pattern often descends slowly over a period of hours, with, for example, a sharp wind shear first appearing above 150 km height then moving downward to below 100 km before fading. The cause of this rather unexpected wind structure appears to be the propagation of atmospheric waves horizontally over great distances.

"The sharp wind shears are at the roots of the sporadic E layers, though in rather a complicated way. The winds, tenuous though they are at such heights, act to move the ions and electrons in the ionosphere across the Earth's magnetic field, but interactions then occur in such a way as to displace the plasma vertically. Where strong wind shears of the appropriate sense exist, the plasma is squeezed into a thin concentrated layer, being moved downwards from above, upwards from below. As the wind pattern descends the layer descends, too, into an even more dense atmosphere, until finally at a height of about 100 km it is brought to a halt.

"In a very productive experiment at Woomera in 1971 a Skylark rocket was launched with a ground-based ionsonde showing a strong layer overhead. Instruments on the rocket measured the exact position of the layer and, something of a novelty, the ambient electric field as well; the wind structure was also charted, in better than usual detail. A very strong wind shear was found, but the layer was not quite where theory required until a correction was applied for the additional constraint imposed on the electrical charges by the electric field.

"Sporadic E, then, owes its transient character to interactions between atmospheric waves, the ionospheric E layer and magnetic and electric fields. All but the magnetic field are constantly changing so that the right conditions for layer formation to occur — well, sporadically. If the question is asked why the explanation has been so long in coming — I should explain that phycisists the world over have contributed to the solution — the answer is that the region concerned, roughly 100-200 km above the Earth's surface, is inaccessible to satellites and therefore to regular on-the-spot measurements.

"One final point: Were the sporadic E layers to be composed simply of ionised atmospheric

gases they wouldn't persist. They are, in fact, composed of ionised metallic atoms, mainly magnesium, silicon and iron, probably the remains of burned-up meteorites. The descending wind shears sweep up the metallic ions and bring them down as Sporadic E layers out of the thermosphere into the lower regions where atmospheric turbulence then churns them away into oblivion. Sporadic E layers seem to be the product of Nature's vacuum cleaning! . . . E. B. Dorling, Mullard Space Science Laboratory, University College, London. Holmbury St. Mary, Surrey."

So there you have it. I would think most of the above will be news to many, and may fill in some of the gaps in your former thinking.

HF NET FOR VHF OPS

During discussions recently with Robert VK3AUR in The Grampians, moves were finally made to get the workings of an HF net off the ground for the purpose of the exchange of information between various VHF and UHF operators. At the time of writing it has been operating for two weeks on 3560 kHz, plus or minus QRM, with Robert VK3AUR as the co-ordinating station. The reason 3560 was chosen was to give Novice operators a chance to also join in if they desired, as one of their ultimate goals could well be operation in VHF. The net commences at 1930 EST, and will continue for as long as required each Wednesday night until decided otherwise.

If your interests are largely orientated towards VHF/UHF, then you are invited to join in the discussions or listen as you choose. Maybe something will be gleaned from the conversation which will be of help or interest to you. Changes to operating times and procedures will no doubt be made from time to time; if you don't hear the net at 1930 EST maybe it is running later for the benefit of VK6 operators, so look around the frequency a bit later, Robert VK3AUR is bound to be there!

NEW ZEALAND

I note from the pages of "Break In" that some consideration has been given in that country to a six metre band plan! However, it was decided that, as the band was a DX band and shared by many, that it should not become a "channellised" band. Some regular 6 metre operators felt with likely increased band openings in the future there should be no restrictions on where one should operate. After discussion, two spot frequencies were decided upon, 52.525 for FM and 51.600 for AM simplex operation. Repeaters were to be discouraged.

Also from "Break In" comes news of a new 2 metre "Internal Record" set by ZL1AM and ZL4TCA during last December. The distance was 993.3 km. Also Steve KH6IHP has written to ZL1BBZ seeking contacts over the 4,400 mile path on 144 MHz in an attempt to beat the present 3,940 mile record. He runs 160 watts to a 16 dB gain antenna over a complete water path, so he could possibly have a chance if he can get anyone interested at the ZL end. The fact that nothing seems to happen across the Tasman between VK and ZL on 2 metres doesn't lend much comfort for an upsurge in interest either there or here in VK for a similar attempt. What about a Sydney to ZL contact on 2 metres for starters, chaps? Why not a VK7 to ZL contact as well? Both these paths should be possible on Es at least at the right time of the year, and possibly rarer occasions by other propagation means.

SERG CONVENTION

The South East Radio Group in Mt. Gambier held another very successful convention on the week-end of 3rd June with more than 100 amateurs registering. The winner of the SERG trophy for the second time was Peter VK3AWY, a well deserved win, as Peter really enjoys himself and enters most of the events. Once again the weather was kind and cleared of the earlier rain. The ladies are to be congratulated on their great evening meal on the Sunday. I am sure all who were present for the week-end will be looking forward to the 15th Convention next year.

During the Sunday evening at Mt. Gambier a discussion was initiated on the proposed extended use of Ch. 5A TV throughout Australia and in the Hamilton, Victoria, region in particular. Whilst the words of the speakers did not actually fall on deaf ears, the subject did not arouse a lot of discussion at the time, but it is hoped amateurs will be thinking of the total implications of what this non-international channel will do to the 144 MHz band. It is well known that we amateurs are a confounded nuisance in the eyes of the various administrations and something they have tolerated to a degree so far, but I doubt if any tears would be shed at their level if we did not exist as an operating body — there would be more spectrum space available to be sold at a higher figure than we pay for it. Anyway, I am not going to prolong discussion on the subject just at the moment, as I am in the course of preparing an article on the subject which I hope will be in AR next month for you to read.

Instead I will close with the thought for the month — a month which has slipped into a quieter form of activity as winter approaches and the VHF bands take up their usual quietness for the time of the year: "When Grandma was a girl she didn't do the things girls do today. But then grandmas didn't do the things grandmas do today."

The Voice in the Hills. ■

AMATEUR SATELLITES

Chas. Robinson VK3ACR
(VK3ZBB is temporarily overseas)

A letter has been received from Harry JA1ANG, our AMSAT Asian Pacific Net Co-ordinator. Harry has just returned from a three week trip to Europe and the United States. He wishes to thank all those who kept the net going during his absence.

When in the US he had the pleasure of having dinner with W3PK Terry Klein (Prexy of AMSAT) and his family, and while in West Germany spoke to Karl DJ4ZC, who built the Mode B transponder for Oscar 7 and at the present time is building the hardware for the Phase III-A Satellite. Harry said they all send their very best 73 to all out here in this part of the world.

Included in Harry's newsletter were a number of interesting items such as the update on orbital elements (AMSAT Oscar 8); these are as follows:

Period: $P = 103.231836 - 1.117 \times 10^{-6}N$.

Increment: $dL = 25.80870162 - 2.325 \times 10^{-7}N$.

N = orbit number.

As of May 8th, 1978, the period was 103.230755 minutes, and the increment was 25.808615 degrees/orbit.

Do not worry, AO-8 is not falling down to the earth! And, for all practical purposes, we can use 103.23 minutes and 25.808 degrees/orbit.

Please note that Mondays are QRP days and Wednesday are reserved for special experiments. AO-8 will be in Mode A on Mondays, Tuesdays, Thursdays and Fridays. Wednesdays will depend on the special experiments that happen to be conducted on that day, but usually will be left in Mode A. On Saturdays and Sundays AO-8 will be in Mode J.

It is interesting to note that Sporadic E and "firm" F_2 layer has been interfering with down-link signals from AO-8 recently. Especially on Mode A, both the 29.402 MHz telemetry beacon and all down-link signals within the 29.4 and 29.5 transponder passband suffer from weak to practically no signal, with severe fluttery QSB due to sporadic E and F_2. However, do not give up! Under these "funny" conditions signals from AO-8 have been heard at very far away places. Although no two-ways have been recorded yet, signals from the satellite when flying over Siberia, for instance, have been heard in the East Coast of the USA!

Who knows, if we keep on trying, maybe a two-way QSO from Asia to the USA may happen. Again, please do not give up during these "funny" conditions.

I have had a number of queries concerning a print-out for Oscar 8 similar to that which was published in AR November 1974, which gives the ascending modes, the azimuth and elevation. As mentioned previously, any satellites put into the same orbit as AMSAT Oscar 6 and 7 would use this existing AR chart. A satellite placed in any other circular orbit would require its own perpetual print-out. There are indications that all four of the Soviet RS Series satellites will have the same orbital characteristics (though considerably different from AMSAT Oscar 7), so a single perpetual print-out would serve all of them. Since Oscar 8 is in a different orbit than Oscar 7, it requires its own perpetual print-out. These, we hope, will be available in the near future. Unfortunately, other satellites in non-circular (i.e., highly elliptical) orbits do not lend themselves to this type of perpetual print-out. The reason for this it that the apogee and perigee process around he earth and a pass with a given equator crossing longitude will not have the same azimuth and elevation angles as a pass with the same equator crossing longitude, say, four months later.

PHASE III FUNDING STATUS REPORT

John Shew N4QQ, via the AMSAT newsletter, states: "Hardware costs for the Phase III project are expected to be in the neighbourhood of $250,000 for two satellites. A complete Phase III satellite requires:

2400 Solar Cells at $10 each	$24,000
12 Battery Cells at $20 each	$2,400
1 Kick Motor	$10,000
2 Transponders at $5,000 each	$10,000
2 Cosmac Computers at $8,000 each	$16,000
	$62,400

A viable Phase III programme requires at least two complete satellites ready at any launch date, the unused back-up hardware available for a later launch.

We have passed the first milestone in our fund-raising campaign. As of February 8, 1978, donations have been received for 2,637 solar cells and 36 battery cells. Thus, we have received donations for more than enough solar cells for the first Phase III satellite and three complete battery systems. According to the last regional tally, submitted by Larry Papke WB5MPU, who handles printing and distribution of solar cells certificates, contributions have been received from all 50 States, all Canadian Provinces and over 42 foreign countries. A significant number of the contributors are non-amateurs, testifying to the universal appeal of the amateur satellite programme.

All contributors to the Phase III programme receive a handsome certificate, acknowledging the exact numbered component sponsored. Contributors of $1,000 or more will be honoured by having their name inscribed on a plaque to be placed on board the first Phase III satellite.

If you can make a donation to this worthwhile venture please make your cheque payable to AMSAT (in US funds) with accompanying note stating your sponsorship and address to AMSAT, PO Box 27, Washington, DC, 20044."

ORBIT PREDICTIONS — SEPTEMBER 1978

OSCAR 7		Time Long.		OSCAR 8		Time Long	
Date	Orbit	Z	°W	Date	Orbit	Z	°W
1	17355B	0012	61.9	1	2501A	0012	42
2	17368B	0106	75.5	2	2515J	0018	44
3	17380A	0005	60.3	3	2529J	0023	45
4	17393B	0100	73.9	4	2543A	0028	46
5	17406B	0154	87.5	5	2557A	0033	48
6	17418A	0053	72.3	6	2571A	0039	49
7	17431B	0148	85.9	7	2585A	0044	50
8	17443B	0047	70.8	8	2599A	0049	51
9	17456A	0141	84.4	9	2613J	0054	53
10	17468B	0040	69.2	10	2627J	0100	54
11	17481B	0135	82.8	11	2641A	0105	55
12	17493A	0034	67.7	12	2655A	0110	57
13	17506B	0128	81.3	13	2669A	0115	58
14	17518B	0028	66.1	14	2683A	0121	59
15	17531A	0122	79.7	15	2697A	0126	61
16	17543B	0021	64.5	16	2711J	0131	62
17	17556B	0116	78.1	17	2725J	0136	63
18	17568A	0015	63.0	18	2739A	0141	64
19	17581B	0109	76.6	19	2753A	0003	40
20	17593B	0009	61.4	20	2767A	0008	41
21	17606A	0103	75.0	21	2781A	0013	43
22	17618B	0002	59.9	22	2795A	0018	44
23	17631B	0057	73.4	28	2809J	0023	45
24	17644A	0151	87.0	24	2823J	0029	46
25	17656B	0050	71.9	25	2837A	0034	48
26	17669B	0144	85.5	26	2851A	0039	49
27	17681A	0044	70.3	27	2865A	0044	50
28	17694B	0138	83.9	28	2879A	0050	52
29	17706B	0037	68.8	29	2883A	0055	53
30	17719A	0132	82.4	30	2906J	0100	54

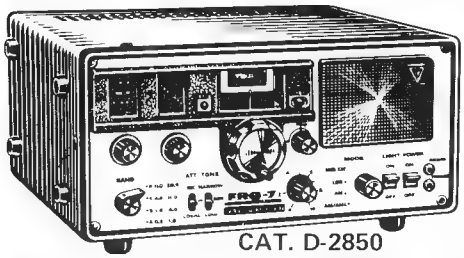
YAESU from DICK SMITH

WHEN YOU REALLY CONSIDER THE ALTERNATIVES – THERE ARE NONE!

Fabulous FRG-7 Communications Receiver

* 0.5 to 30MHz continuous reception
* Wadley loop circuitry for stability
* Mains or 12 volt operation – portable.
* BFO for sideband or CW reception
* 0.7uV sensitivity (for 10dB signal/noise)
* 2 IC's, 22 transistors and 16 diodes
* Comes with full instructions plus guide

EXCLUSIVE!
With every FRG-7 from Dick Smith or dealers, you receive this exclusive 6 page guide to short wave listening – written by Arthur Cushen, MBE – world famous short-wave correspondent and broadcaster.



CAT. D-2850

only $350

Terms available

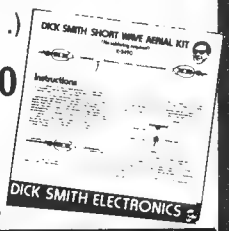
See the review in MAY 1978 E.A.

★★★★★★★★★★★★★★★★★★★★★★★★★★

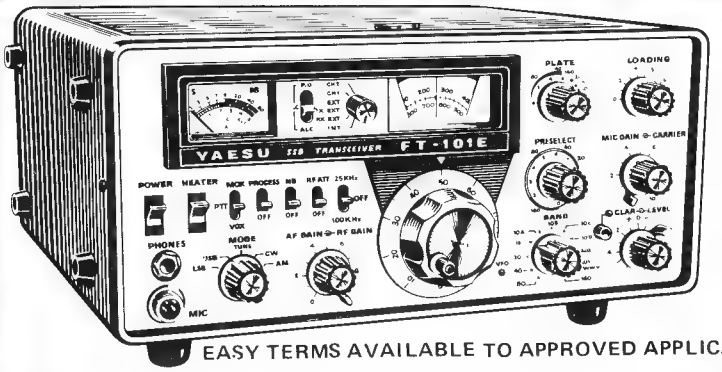
NOW: A short wave antenna kit for the FRG-7 receiver (and any other shortwave receiver . . .)

Designed specifically for Dick by a short-wave expert, this antenna kit needs no soldering, is complete and ready to assemble and has full instructions. Get the most out of your receiver with a good antenna.

$9.50



VALUE! Cat K-3490



EASY TERMS AVAILABLE TO APPROVED APPLICANTS

THE INCREDIBLE FT101E.... WORLD'S TOP TOP SELLING HF TRANSCEIVER –

Why settle for less ?

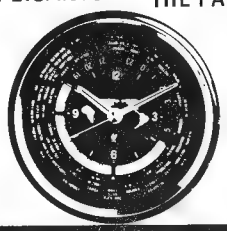
The *complete* 160M-10M HF amateur radio just add antenna and either 240V or 12V (yes, it has an inbuilt DC–DC converter!). Rated at 260W PEP and the in-built RF speech processor makes it sound even better.
These units are so popular, we probably don't have to tell you about all their fabulous features but call into D. S. store and we'll be happy to anyway!

Cat D-2860 . . . . . $895.00

Impartial tests * prove the FT-101E receiver section is far superior to the TS-520S:

Minimum detectable level:	FT-101E 8dB MORE SENSITIVE
Intermodulation distortion:	FT-101E 4dB BETTER
Dynamic range:	FT-101E 12dB BETTER

(* QST May 1978 comparison)

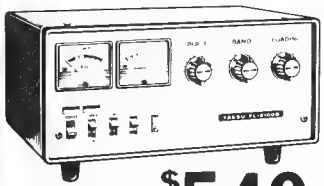


WHY NOT BUILD YOUR WHOLE STATION AROUND THE FABULOUS FT-101E?

(Left) The QTR24 world clock. Work out at a glance what the time is in all time zones. Every ham should have one.
Cat X-1054 .. .. $33.00

(Right) YD-844A desk microphone. 500 ohm/50k switch makes this ideal for all Yaesu transceivers. Complete YOUR base station with a Yaesu microphone.
Cat C-1116 .. .. $44.50

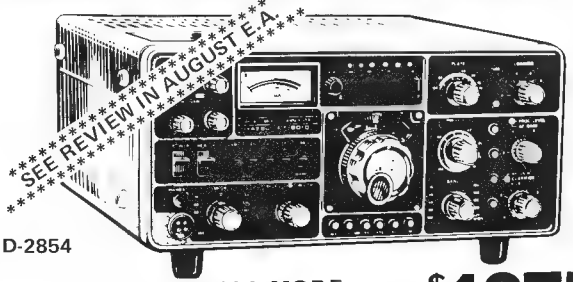
HOW'S THIS FOR THE ULTIMATE STATION?



FL-2100B HF LINEAR AMP $540

Time proven reliability! The 2100B is world famous for it's GUTS! 1.2kW of muscle – the ideal match for the FT-901D or the FT-101E. Best value linear amp available today!
Cat D-2546

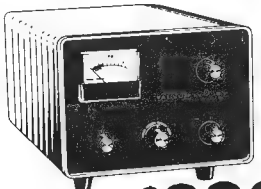
Easy terms available on all Yaesu transceivers to approved applicants. Ask at your store!



Cat D-2854

FT-901 D – ALL MODE ALL HF BAND TRANSCEIVER $1275

Tomorrow's transceiver today . . . All mode operation – yes, even FM! This beautiful Yaesu has to be seen (and heard) to be believed. It's got features others just dream of!
Basic unit: $1275 . . . Add the optional memory unit (Cat D-2858 @ $149.50) and the DC-DC converter (Cat D-2856 @ $75.00) and still pay less than $1500.00 . . .
The acc plug features switchable 12V coupled to the band switch. Use our co-ax relay (Cat D-5210) to automatically switch antennas. WHY PAY MORE?



FTV-250 – 2 M TRANSVERTER $329

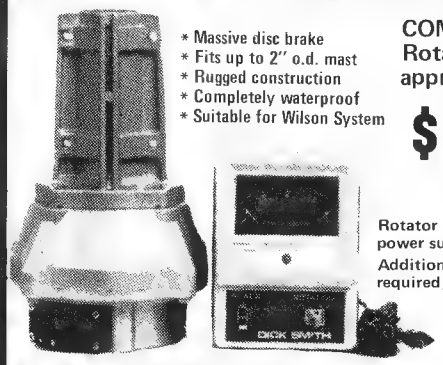
FULL 2M operation when used with the FT-901D. SSB & CW for DX & OSCAR enthusiasts – FM for local work . . . Covers 144 to 148MHz, all solid state. Also suits the fabulous FT-101E
Why miss out on some of the hard-won bands. Remember: use them or lose them!
Cat. D-2894

DICK SMITH for AMATEURS

Dick has an enormous range of amateur equipment, and it's growing daily! Call in today and have a look around. You're under no obligation! Dick Smith Electronics — the professional amateur suppliers.

New FULLY LEGAL ANTENNA ROTATOR

Handles most beams with ease. Supplied with fully approved power supply (Cat. M-9560) and large, easy-to-read control box.



* Massive disc brake
* Fits up to 2" o.d. mast
* Rugged construction
* Completely waterproof
* Suitable for Wilson System

COMPLETE UNIT — Rotator, control unit and approved power supply:

$148.00

Rotator & control box without power supply: Cat D-5000 .. . $122.00

Additional mast clamps (if required): Cat D-5001 .. .. . $12.50

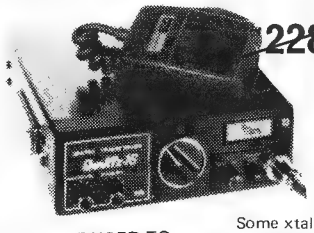
WE BELIEVE THIS IS THE ONLY APPROVED ROTATOR IN ITS CLASS IN AUSTRALIA!

BARGAIN ROTATOR CABLE: 4 core cable for only 35c/metre. Sure, you'll need two lengths — but you get the equivalent of an 8-core cable. Parallel wires to the motor for minimum voltage drop or use spare wires to control antenna changeover relays! Ideally suited to above rotator. Cat. W-2040 .. .. 35c/metre

INCREDIBLE BARGAINS!

MULTI Q-16 2m TRANSCEIVER

2 special priority positions to monitor your favourite cahnnels * Large 23 ch. capacity * Provision for external VFO



NOW REDUCED TO ONLY **169.50**

Cat D-3009

Some xtals available for only $4.75 pr. Check at a store!

XXXX SPECIAL APOLLO LINEAR

was $299.50 now $199.50

$100 OFF

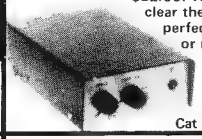
* Full 200W SSB *40–10M
* In-built RF pre-amp
* Only 3Wdrive
* RF actuated — no messy control wires!

Cat D-2544

Originally $229.50 Save $100 !
NOW REDUCED TO ONLY $199.50
Don't miss out — Stock strictly limited.

BELOW COST!

FK-2 IC keyer was $82, now $32.00! Way below cost to clear them out. They work perfectly, but no g'tee or return at this price!



Cat D-7102 **$32**

No-hands mobile

Safety and ease of operation for all mobilers. Headset mic/earpiece suits most rigs — 600 ohm mic, 8 ohm 'phone. Wire to suit your rig (plug extra).

Cat C-1120

$27.50

FOR MORSE CODERS:

Economy Key

Yes, that's the right price. Only $1.80 for a bargain key that's ideal as a first key. Excellent value for money, Cat D-7105

$1.80

LEARN MORSE...

Here's value: two cassettes recorded with easy-to-learn Morse. Starts off simple, goes to full novice standard. Completely aural course — no printed matter to slow you down!

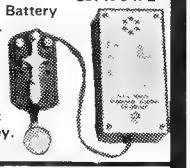
$7.90

Cat D-7106

Morse trainer

Kit contains all parts to build this practice oscillator. Battery operated, ideal project.

Cat K-3472



Key Extra. **$5.90**

BUILT-UP VERSION: As pictured, but no key. Cat D-7110 .. .. $7.90

Quality budget key

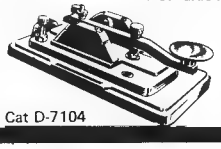
Nye Viking

New magn ficent precision built key Pro quality — hours of relaxed operation, Introductory price Cat D-7101

$14.75

Hi-Mound deluxe

When you want a REAL morse key, here's the Hi—Mound. It's probably one of the best hand keys on the market — and at the budget price from Dick one of the best value keys around.



Cat D-7104 **$25.00**

KEYER KIT $37.50

Complete kit inc. paddle. Case is undrilled, plain panels See E.A. March '78. Cat K-3470.

PADDLE only: Cat D-7103 .. .. $17.50

Banish TVI FOREVER!

The ULTIMATE in low-pass filters!

Precision built, 4 section filter. Massive power rating — 5000W PEP on SSB. Maximum attenuation is on TV channel 2 — 75dB. Insertion loss is less than 0.5 dB, has SO-239 connectors. 52 ohms.

WHY TAKE CHANCES? **$37.50**

Cat D-7086

New! Wilson HF antennas

SYSTEM ONE BEAM

* 5 element
* 10dB gain!
* 8m boom
* 8m longest element
* 5.6m turning radius

$425 Cat D-4330

SYSTEM TWO BEAM

* 4 element
* 8.5dB gain
* 5.6m boom
* 8m longest element
* 5m turning radius

$320 Cat D-4332

BOTH ANTENNAS 50 OHMS IMPEDANCE, SWR LESS THAN 1.5:1
HUGE POWER RATING — KILOWATT PLUS . . .
Maximum strength and minimum wind resistance

Optional recommended toroidal balun for either system: Cat D-4334 .. $19.95

NEW! Tetra tower sections

Dick Smith really is the complete amateur store: Now you can even buy your tower from us!

Cat D-4336 **$59.50** PER SECTION

Introducing: the Wilson Tetra Tower system: You can buy one section at a time, or you can buy a complete mast. Each section is 3.5 metres long when assembled, yet is supplied in a carton only 1 metre long. No need to hire a truck!

You can assemble as many 3.5m sections as you like — 4 give you a 14m mast, (45'4") etc etc. Accepts a 2" o.d. mast at top. Extremely strong (will support the system one at 68 ft suitably guyed)

It's the painless way to buy a world-class tower.

Tower top & rotor plate option: Cat D-4338 .. .. .. $29.50

DICK SMITH ELECTRONICS

AT LAST! THE YAESU FRG—7000

Yes! It's been a long time coming — but the wait was well and truly worth it . . .
The Yaesu FRG-7000 offers the serious SWL the ultimate in a communications receiver

- Digital frequency readout for accuracy (and allow absolute certainty in returning to a previously logged station)
- Full band coverage — from 0.25MHz (yes, 0.25) up to 29.9MHz — with provision for AM, SSB and CW reception
- Digital clock built-in displays local OR GMT (at the flick of a switch) plus allows the receiver to be turned on at any time (eg for recording when you're not there!)
- Wadley Loop circuitry for rock-solid stability plus FET front end for sensitivity
- Operates from 100 to 240V AC 50/60Hz (easy modification allows portable 12V use)

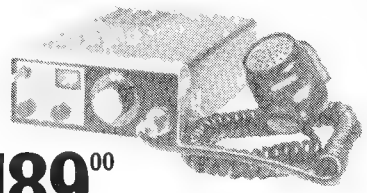
Cat D-2848

$695

Terms are available on either unit to personal shoppers • from a low 10% deposit and easy payments.
Mail order customers: We'll send this unit or the FRG-7 to anywhere in Australia for $5.00 — by Comet.

Magnificent SCOOP PURCHASE

KENWOOD **TR-2200** 2m portable



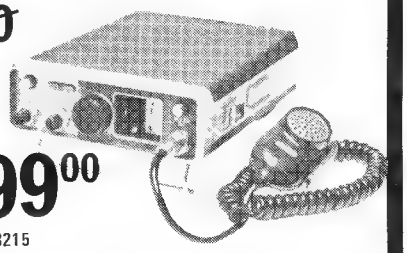
$189.00

Cat D-3210

We've bought the entire Australian stock of the famous Kenwood TR-2200 2 metre portable. Never again available at this price! Two years ago it was selling for $199.50 — todays price is even lower. Now is your chance to buy a versatile portable at a never-to-be-repeated price. DON'T MISS OUT!

KENWOOD **TR-7200** 2m mobile **TOP VALUE**

~~$260~~



$199.00

Cat D-3215

Fabulous 2 metre FM mobile transceiver features hi/lo power switch (1/10W) to save battery, reverse polarity protection, provision for 22 channels, diode RF switching, etc etc etc . . . Hurry in for this special — they're reduced to clear. Only a few left and this price lasts only while stocks last.

EXCLUSIVE TO DICK!

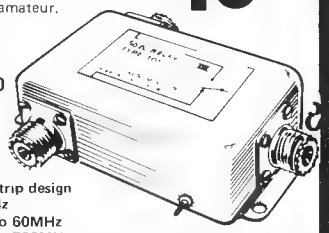
FABULOUS NEW HEAVY DUTY

CO-AX RELAY

Save the high cost of an extra length of co-ax. Make instant antenna comparisons. Instant horizontal to vertical change-over. A truly professional relay for the serious amateur.

$49.50

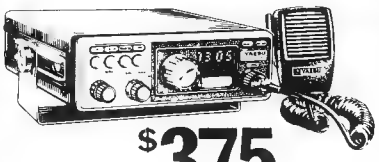
Cat D-5210



- waterproof
- latest micro-strip design
- 1.5 — 500MHz
- 2500W PEP to 60MHz
- 1500W PEP to 500MHz
- 9 — 18V control voltage
- 52 ohm impedance
- insertion loss less than 0.1dB
- insertion noise 'too low to measure'

DON'T SETTLE FOR INFERIOR UNITS!

EASY TERMS AVAILABLE TO APPROVED APPLICANTS ON ALL ITEMS PRICED $111 OR MORE.



$375

FT-227R — FULL 2M RIG

As reviewed in the March issue of Electronics Australia. Full 2 metre, synthesised FM unit with memory. Ideal for repeaters and duplex operation. Best value rig available today!
Cat D-2890

$380

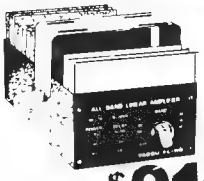
YC-500S — 500MHz COUNTER

Fabulous professional quality — 500MHz counter. As reviewed in April E.A. 240V or 12V operation. And it's even cheaper if you have a sales tax exemption!
Cat D-2892

$539

FT-7 — NEW HF MOBILE RIG

Here it is! The new HF solid state 80 — 10 metre mobile transceiver. It's ideal for novice use, too. The best mobile unit going!
Cat D-2866



$210

FL-110 — 200W LINEAR

Use the FT-7 or FT-301S as a full-power unit with the 200W linear amplifier. One knob band switching, no tuning required.
Cat D-2884

DICK SMITH ELECTRONICS

bankcard welcome here

SYDNEY 125 York Street, SYDNEY. Ph. 29-1126
147 Hume Hwy, CHULLORA. Ph. 642-8922
162 Pacific Hwy, GORE HILL. Ph. 439-5311
30 Grose Street, PARRAMATTA. Ph. 683-1133

MELBOURNE 399 Lonsdale Street, MELBOURNE. Ph. 67-9834
656 Bridge Road, RICHMOND, Ph. 42-1614

BRISBANE 166 Logan Road, BURANDA. Ph. 391-6233

ADELAIDE 203 Wright Street, ADELAIDE. Ph. 212-1962

MAIL ORDERS P.O. Box 747, Crows Nest, N.S.W. 2065. Post and packing extra.

Dealers across Australia.

SHOPS OPEN 9AM to 5.30PM (Saturday 9AM — 12 noon)
BRISBANE 1/2 Hour earlier.

• ANY TERMS OFFERED ARE TO APPROVED APPLICANTS ONLY

Many lines available from the Dick Smith Electronics Centres at

GRACE BROS

Broadway • Bondi • Chatswood • Liverpool
Miranda • Mt Druitt • Parramatta • Roselands
and Warringah Mall

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

Dear OM,
The Editor,

Dear Sir,

A month ago, I reactivated my second QTH callsign DL3FMA. I use a TEN-TEC "Century/21" at about 60 watts input power and a 3-element rotary Yagi.

Results obtained so far have been so promising that I would like to have schedules with stations Down Under.

I have worked a lot of Australian stations thus showing that the long path can successfully be used by my relatively low power rig.

I think that there is a special Australian amateur radio magazine. May I ask you to put into this monthly that I am anxious to get in contact with any Australian radio amateur who, like me, would be interested in a schedule. He may drop a line to the following address:

Prof. Dr. Karl G. Lickfeld, DL3FMA
Inst. f. Med. Mikrobiologie
Hufelandstr. 55
D-4300 Essen 1
W. Germany (FRG)

I thank you in advance for your kind help. Letting you know that I very much enjoyed a stay in Australia in 1974, I am sincerely yours, Karl Lickfeld. ■

The Editor,
Dear Sir,

Leaving Australia after a most pleasant holiday, we, the XYL and myself, wish to say that we agree 100 per cent with Art Linkletter who says in his book Down Under: "Nothing in Australia is king-size, everything is giant-size!"

So has been the hospitality we found everywhere in your wonderful and interesting country.

Cuagn sn frm PA0-land, 73, A10

C. Valkhof, VK3BLZ/PA0ALO, 6 Anna Court, Sale, 3850. ■

7 Norman Ave., Frankston, 3199
10 June 1987

The Editor,

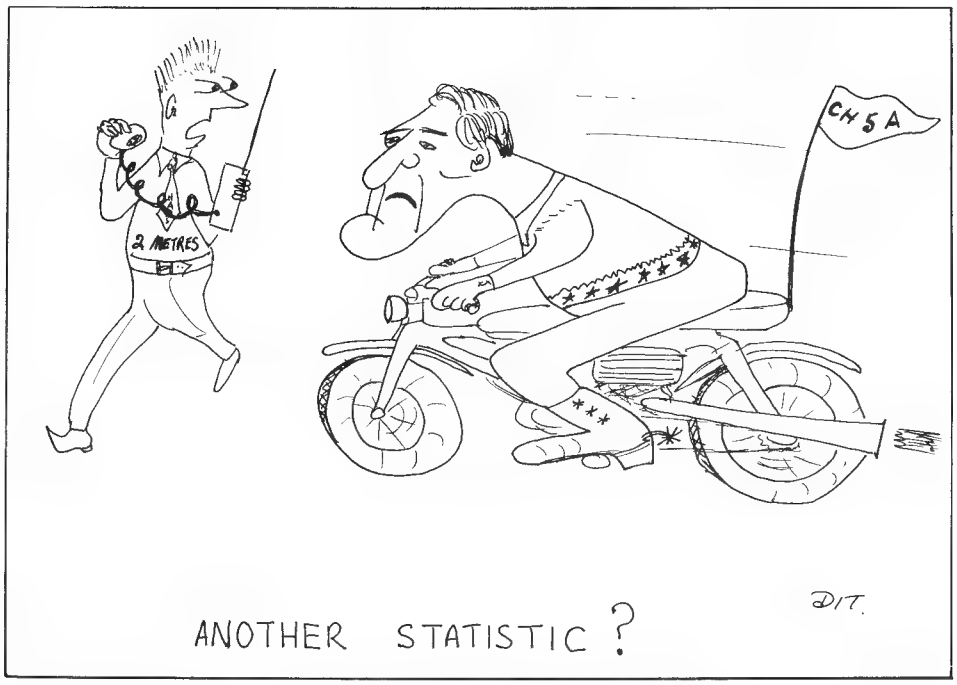
Dear Sir,

I would like to make a plea to all Amateurs and prospective Amateurs to carefully read through the correspondence from Steve Gregory VK3OT and Robert Wilkins VK3AUR in June 1978 "Amateur Radio" relating to the new channel 5A TV allocations, particularly in Western Victoria. If these two Amateurs are the only ones who are going to protest at the rape of yet another Amateur band, then all I can say is that we thoroughly deserve to lose the 2m band.

The apathy shown by the vast majority of Amateurs, both within the WIA and outside it, is incredible.

At the time I was first licensed in the early 1960s there was an attitude which prevailed among many Amateurs that we should never rock the boat, treat the P. & T. (then P.M.G.'s.) Dept. as a holy cow above reproach, ask for favours in a cap in hand fashion and all would be well with the world. Unfortunately, I feel that with many people this attitude still exists even today, but it's totally unrealistic.

On a number of recent occasions the extent to which the P. & T. Dept. care for Amateurs' interests has been clearly demonstrated. When reporting a case of very blatant pirate operation on 10m by a Melbourne station claiming one day to be a ZL4 and on another day to be a VK1 (same name, equipment, voice, beam heading), I was told by a P. & T. official, "Frankly, we just aren't interested". When the local monitoring and frequency measuring station was advised and given details of frequency, beam heading and callsign being used, I was asked "What kHz is that?" and after a few minutes' apparent search for the signal I was told there was no trace of any 10m signals at the station. This



despite the fact that at the time there were dozens of S9 plus signals on the band! The fact that we accept being fobbed off in this manner is our fault and does our cause harm by not pursuing the matter.

Recently, when Eric Jamieson VK5LP tried to stir up interest in making an approach to regain the Six Metre band, the number of people who even bothered to show support was pathetic. Congratulations to those who did bother to write with your ideas and encouragement, but what about the rest of you? I feel sure had Eric's campaign brought the band back immediately there would have been a multiude of operators active — after someone else had done the spadework!

For many years now we have had it drummed into us that the spectre of WARC '79 looms over us but those who have made the greatest noise about it have given little if any lead to the individual member as to how he or she can do their bit to help. I feel the WIA has fallen down in its duty (perhaps unknowingly and with the best of intentions) in getting the message across. Those closest to the problem may suffer from a lack of ability to communicate adequately to the general membership. The obvious measures we can all take are to: If not already a member of the WIA, join and add YOUR support to the only organziation that can represent your interests. If you don't agree with WIA policy, fair enough, at least be part of the WIA and show how it might be improved, from within instead of from the sidelines. Use the bands that are available to you (whether a Full, Limited or Novice licensee) as often as possible and ensure you play your part in maintaining activity. When you do operate, do so in a manner befitting a member of the Amateur Service, show that you know how to operate properly, this will make the CBers and HFers in our bands a lot easier to spot.

To return to the matter of channel 5A, we now have the prospect that in many areas there will be no operation possible on either the 6m or 2m Amateur bands. To those of you unfamiliar with such a situation, ask any 6m operator from Brisbane, Melbourne or Wagga how funny it has been trying to operate OR EVEN LISTEN on 6m since 1964.

I would like to ask one very important question. Why is it that in Australia those in charge of frequency planning are unable to produce anything other than an utter shambles?

In the USA, which has roughly the same area as Australia, but with a population of well over 200 million plus many millions more in surrounding areas such as Canada, Mexico, Central America and the Caribbean, they enjoy the most generous Amateur frequency allocations anywhere. Here we have the ludicrous situation of Australian stations on 80m and 40m being limited to 3.500-3.700 MHz and 7.000-7.150 MHz while stations as close as New Zealand operate as strongly as any locals in the full allocation on both bands. In the USA full VHF and UHF Amateur allocations co-exist with TV services with little if any trouble. Here we have the 6m band reduced to half (52-54 MHz) and virtually unusable in two major metropolitan areas because of TVI. On 2m the same sad story has been repeated in both Wollongong and Newcastle with worse to come.

The letter from the Prime Minister to Steve VK3OT states (in part) "The Minister advised that, bearing in mind the number of services that will be provided in the area and the lack of available frequencies, it is considered that there is no suitable alternative available". We all know of the problems with frequencies for TV but what effort has been put into working out a proper solution? Why aren't the UHF frequencies available being utilised? Are these being held back until after WARC '79? If so, why are other countries heavily involved in UHF TV?

Surely UHF would be an ideal answer to the 5A problem. Every day the number of old monochrome TV receivers grows less and all new TV receivers either have UHF tuners or provision for them. Certainly VHF may give better coverage from one station but this is what channel 0 thought in 1963, but really, do they want to have viewers in Alaska and Japan? The intelligent use of UHF and the number of channels available could easily solve the 5A problem. Sooner or later we must go UHF so why not now?

To say there are no suitable frequencies available is too stupid for comment. How do the cities of the eastern USA seaboard fare with the enormous number of transmitters in use there?

Before it is too late we must all do SOMETHING to try and save our VHF bands, if we lose 2m, there will be NO VHF Amateur bands for many, even most, Australian Amateurs, contemplate this situation! As things stand at the moment there seems little if any likelihood that this situation will not come about.

Yours faithfully, Geoff Wilson VK3AMK. ■

5 Cahill Street,
Strathpine 4500.
29th June, 1978.

The Editor,

Dear Sir,

You published two articles for me in the December 1977 edition of AR. At the end of the articles I mentioned that I would supply PCBs for the units. I have supplied boards in dribs and drabs for the last six months and would now like to put an end to it. Could you please publish in some appropriate place in your magazine that the Christmas tree lights boards are $5.00, plus postage (40c), and the Two Tone Oscillator boards are

$4.00, including postage. No more boards or enquiries will be supplied after the end of September this year.

Yours faithfully,

N. Cooper VK4ZNC. ■

179 Bridge Street,
Benalla, Vic. 3672.
29th June, 1978.

The Editor,
Dear Sir,

I have just received my first copy of Amateur Radio, which I read with great interest and enjoyment until I read a letter by Stephen Gregory VK3OT referring to the "DX and You" column.

I was very disappointed with the vicious criticism displayed in the letter, and felt it rather unnecessary. I must point out that the writer of that column is prepared to contribute more for Amateur Radio in a practical way than simply to sit back and write over-critical letters of someone else's efforts.

I trust that this attitude of apparent total intolerance is not a general one among amateurs otherwise all the effort I have put into working for an amateur licence has been a complete waste of time.

Yours faithfully,

D. G. Laity. ■

1 Hillside Crescent,
Epping, NSW 2121.
June 23rd, 1978.

The Editor,
Dear Sir,

Granted the fact that there are a lot of Novices (and lots more to come!), could we have more articles in AR that are down to our level?

I'm sure that the Full Call members wouldn't mind a bit. All the Full Call folk I've met are falling over themselves to help the half-baked types like myself.

A couple of cases in point. On page 21 of June AR I find a paragraph on how to make a DVM adapter. Now I have no doubt that many Novices, and probably all Full Call members, will know what "DVM" means. But I just don't, and I suspect that quite a few Novices don't know either. Why not use a little more ink and spell the whole three words out!

Further. On page 15 of the same issue there is a "Two tube phasing rig" which I would like to make up. But I simply don't know enough to even attempt this project on the emaciated data supplied. I know that some reading this letter will nearly have died laughing by now . . . but maybe those who are laughing may have forgotten that they were once half-baked, too. Mayday. Mayday. I'm sinking in a sea of superior technology and unnecessary abbreviations. Such a little difference would be a big help to others like me.

Yours faithfully,

Norman Blake VK2NDG.

(Editor's note: Our "Novice Notes" column will be a regular feature (every 2/3 months at the moment). We would appreciate some Novice-oriented articles from readers in this regard. Incidentally, a DVM is a "Digital Volt Meter".) ■

6 John Street,
Cootmundra, NSW 2590.
24-6-1978.

The Editor,
Dear Sir,

Hamads is a marvellous service to all amateurs, yet it is possible to get caught.

Last year I advertised a piece of equipment and received a few replies. The main interested buyer was $100 cash short of the agreed price. As I believed all amateurs to be honourable gentlemen (he is a full call), I sent the set to help him out, and received his bank cheque.

The verbal agreement was that he would pay the balance when he could. After a month, I wrote a friendly reminder, but received no reply. Several more letters and a couple of attempted phone calls (he was not in) followed, during about five months, to no avail. Finally, I had my solicitor draft a letter to him. His solicitor replied on his behalf, denying a balance existed!

Therefore I lost $100 and he gained a cheap set with a full complement of spare tubes. Possibly this happens often, so I have written this letter in the hope that it may prevent someone else getting caught.

The next time I sell an item I will have cash in hand before despatching it!

Sincerely yours,

Geoff Barron VK2AZT. ■

13 Salisbury Avenue,
Bexley 2207.
26-6-1978.

The Editor,
Dear Sir,

A few lines about the National Field Day, which I think is both enjoyable and a very valuable technical exercise, because it forces one to prepare the gear available and to make it work under emergency conditions.

For about 25 years I have entered the NFD using low power and on CW only. The number of CW stations is low, worse luck, but I think the section should be maintained while it is viable.

Here I have a confession to make, in that I wandered off and went SSB on relatively high power this year (1978).

Receiving the results in a recent AR seems to show that the CW sections were supported even less than usual.

Therefore, I intend to go back to CW in 1979 and I wonder if you could publicise the need to maintain a CW activity in Amateur Radio and the reasons for doing so, particularly the good effect obtained on low power.

This presumes that you agree with me.

I feel that going SSB after so long on CW in NFD was like deserting an old friend!

Yours faithfully,

J. A. Mead VK2JM. ■

WARC 79 — NEXT YEAR

20/6/78.

The Editor,
Dear Sir,

I refer to page 46 of AR June 1978, wherein is reference to "Why should ITU standard morse be the standard for examinations when you're rarely likely to hear it on air anyway?".

Apart from the fact that the second half of the quoted statement is nonsense and far from the truth, I think that the question concerned is one which the Editor of "Radio ZS" (SARL magazine) answered in his Editorial in February 1978. His statement applies just as much to would-be Australian radio amateur operators as it does to South African counterparts, and I ask, sir, that you kindly give space to printing it, as follows:—

"Editorial:

CW TELEGRAPHY QUO VADIS?

One of the less satisfactory sequels to the advance of technology, so far as the radio amateur is concerned, is the approaching demise of manual telegraphy as a mode of direct communications. It is clearly defined in plans made in the maritime service and elsewhere that CWD telegraphy shall be superseded by teleprinter and data communications. With the passing of Morse will go the ship's 'Sparks'. The aeronautical operator has already succumbed.

Some ZR licensees may feel irked that they will have to pass an examination, albeit at 12 w/min. in an almost outmoded code, which will not be in use whilst they are still young and active hams. However, radio amateurs are members of an exclusive society, and part of the exclusivity is proficiency in telegraphy. It may be that the authorities share in this point of view, and in an effort to keep the numbers of amateurs within economical bounds, have used the examinations in regulations, theory and the Morse code as a means to this end. Should we complain? Of course not — we had to come up the hard way — if others wish to join us let them join us as peers.

It is encumbent on those who have received the accolade of the ZS call, to encourage our ZR members to advance to full participation in amateur radio: To this end ZS1HQ is sending the Headquarters Bulletin on 7.050 kHz on Sundays from 07h45B to 08h15B, and Branches are exhorted to supplement Technical Colleges and private tutors' lessons by on-the-air Morse tuition.

It is necessary that the ZS licence be seen as a challenge and a hurdle to be surmounted, but the means to overcome the obstacles must be provided for the enthusiastic.

73 de Peter ZS1U."

It is my honest opinion that, unlike what is being pedalled around today, CW telegraphy will continue to provide countless contacts, with a wonderful means of two-way communication, especially in amateur radio circles, just as it has done for millions of men, women, boys and girls, 5 years to 95 years, during the past century, the world over.

Eric Trebilcock L30042.
Thornbury 3071. ■

Technical Articles Always Needed

3 Maxwell Street,
Lalor, Vic. 3075.
VK3WW.

The Editor,
Dear Sir,

On the 5th of June I was unlucky enough to be involved in a five car pile-up on the Hume Highway, south of Wangaratta.

After clearing the road I called on two metres and established contact with Bruce VK3ZSR in Wangaratta. Bruce then contacted my son in Melbourne on the 600 ohm line, passed relevant details and arranged for him to come and pick us up.

This quick and efficient action was not only a relief to me but more so to my XYL who was suffering from shock.

Through the pages of Amateur Radio I would like to offer my sincere thanks to Bruce, whose action can best be described as operating the true spirit of amateur radio.

Mike O'Burtill VK3WW,
Assist. Secretary WIA Vic. Division. ■

The Editor,
Dear Sir,

Morse Examination Standard.

I believe that I am only one of a large number of amateurs who was quite disillusioned and disappointed by the quality of the 10 w.p.m. morse tape offered by the May Section L telegraphy examination.

Apart from a rather weird audio tone the speed of the transmission appeared to be quite variable and character and word spacing somewhat inconsistent.

After 8 errors at the previous examination I felt confident of success, but would not be surprised if I amassed 30 to 40 errors!

Surely the matter should be taken up with P. and T. so that examinations present morse of a suitable quality to give everyone a reasonable chance of achieving their aim — the full licence.

Maurie Hooper VK5ZMA/NMH. ■

Join a new Member — NOW —

AWARDS COLUMN

Brian Austin, VK5CA
P.O. Box 7A, Crafers SA, 5152

BUDAPEST AWARD

The Budapest Award was founded in 1963. This was a long time ago, and the rapidly increasing number of the Budapest radio amateurs made it necessary for the Radio Amateur League of Budapest to establish certain modifications concerning the rules of the award. The new rules we present here comply with the following requirement: a ham or SWL certificate should be given only and when you make a great performance in amateur radio communications.

1. In order to have a possibility of acquiring our Budapest Award contact (or listen to) different HA5 or HG5 stations as follows:
   EU stations — 75 different HA5 stations.
   DX stations — 25 different HA5 stations.
   VHF stations — 50 different HG5 stations, or 5000 kms summarised distance.
2. Contacts are valid from 1-1-1959. The same station may be represented only once in your application.
3. Any amateur bands and modes may be used. Active (land or air) VHF/UHF repeaters may be used as well. VHF/UHF contacts by satellites or via the Moon count with 500 kms/QSO value.
4. After 1-1-1976 the certificate is issued in one class and may be received only once. So there are no endorsements either.
5. The Radio Amateur League of Budapest is entitled to issue a unique special class of Budapest Award to acknowledge some particularly remarkable amateur radio achievements.
6. Apply with certified list of your contacts (listenings) and send it with 10 IRCs to the Award Manager of BRAL, Dezso Tarcsay HA5HA, H-1553 Budapest, P.O. Box 2, Hungary.
7. Please note: There are two activity week-ends of Bundapest radio amateurs, one for HF bands during the second full week-end of May, and one for 2m band a week after that.

THE CQ TV AWARD

To mark the 100th issue of CQ TV, BATC is introducing an operating award scheme whose aim is to encourage activity in amateur television by providing an incentive in the form of a certificate.

This award is available to both transmitting and receiving amateurs and SWLs in any part of the world, whether they are members of the British Amateur Television Club or not.

The award is for contacts made using fast scan high definition television systems only.

Consideration has been given to the advantages achieved by stations in high activity areas or with exceptional geographical locations, therefore qualification for the award is on a points basis as detailed below:

TRANSMITTING AWARD

For pictures transmitted which have been successfully identified by another station claim two points per kilometre; if the contact becomes a successful two-way exchange of pictures then 10 bonus points may be claimed by each station regardless of distance.

Careful logging of transmissions is essential.

RECEIVING AWARD

For any picture positively identified claim 2 points per kilometre.

POINTS

Points are claimed as above, however if the contact is on 23 cm or above, the points should be doubled.

The award is divided into three grades — for the Bronze, 1000 points; for the Silver, 5000 points; and for the Gold, 10,000 points.

CONTACTS

A station may be worked once only per day for the purpose of this award. It is quite possible for the award to be gained by working the same station many times, but the aim is to promote activity of any sort. Points may only be claimed for contacts made from 1-11-1977.

THE CERTIFICATE

Upon qualification for the Bronze award a certificate will be issued together with the Bronze seal; the certificate may be upgraded later with Silver or Gold seals. No charge will be made for the award, but please send return postage with each application.

APPLICATIONS

Applications should include log details consisting of call sign, date of QSO, band, location of the station worked and points claimed. Contacts made from other than the home station should be clearly marked. QSL cards are not required, but the application should be checked and signed by one other licensed amateur. Send to Award Manager, John L. Wood G3YQC, 54 Elkington Road, Yelvertoft, Northampton NN6 7LU.

BEGONIA AWARD

The Ballarat Amateur Radio Group, Victoria, Australia, has initiated the "Begonia Award" Certificate which is available to Amateur Operators or SWLs who can show confirmation of working or hearing Ballarat Amateurs.

As from January 1 1978, the requirements for issue of the certificate are:

1. **DX STATIONS OR SWLs:**
   Work or hear 5 Ballarat Amateur Stations. Any Band, Any Mode. Cost 8 IRCs.
2. **VK STATIONS OR SWLSs:**
   Work or Hear 10 Ballarat Amateur Stations. Any Band, Any Mode. Cost $2.00.
3. **LOGS:**
   Send a list of Stations worked stating Call Sign Name, Date, Band, Mode and Time in Zulu. Do not send QSL Cards.
4. **SEND LIST TO:**
   Award Manager, R. E. Barker, 22 Pauls Crescent, Wendouree, Victoria, Australia, 3355.

From: Brain Stares VK3ZBS, Publicity Officer. ■

MAGAZINE INDEX

Syd Clark, VK3ASC

QST Ferduary 1978
The Micro-TO Message Keyer; A Long-Delayed Echo Revisited; More Reflections on LDEs; The Long-Boom Quagi; BC-Band Energy — A Rejection Filter; A Spectacle Mounted Code Blinker; A Universal Crystal Oscillator; Calculating Capacitor Values; Tracking the Next OSCAR; Blackout Spawns Amateur/Police Emergency Network; RFI Assistance List; La Scala of Milan Cures some Virginia Hams; The Lure of 2 Metres; The Honour Roll: Not for the Faint Hearted; Results, 1977 IARU Radiosport Championship; Frequency Measuring Test; Contest Disqualification Criteria and Club Competition Rules; Ham Activity and Solar Activity: Going Up; FCC Drops 220 Restrictions; Public Relations, German Style.

QST April 1978
A 20-Metre High Performance Direct-Convtrsion Receiver; The State-Variable Filter; Frequency Memory for Receivers with Digital Readout; Go ATV with this Transceiver; Mycoder; Short Ground-Radial Systems for Short Verticals; Collecting a Ham's Tools of the Trade; The Lure of 2 Metres; His Computer Does the Operating; Two Sides of the Public Service Story; Straight Key Night; Results, Eighth Annual ARRL 160 Metre Contest; Simple Equipment and WARC; George, the TV is Acting Up Again; Not Just Bigger — But Better Than Ever; Secondary and Special-Event Licences Abolished; African Amateur Radio: Common Roots.

RADIO COMMUNICATION March 1978
A 144 MHz FM Black Box; The AMSAT-OSCAR D Spacecraft; The Satellite Band Plan; The Robot Model 400 SSTV Converter; Technical Topics.

RADIO ZS January 1978
The ZS6U Minishack Special; Getting the Most out of Your Yaesu FT75-B; The AMSAT-OSCAR D Spacecraft; VHF Meteor Scatter Propagation.

QST March 1978
How Visual Displays Work; A FET Volt-ohmeter with Linear Ohms Readout; New Tasks for the Digital Voltmeter; Locating Geo-synchronous Satellites; A Permeability Tuned Variable-Frequency Oscillator; The Flagpole Deluxe (Antenna); Microwave Mobile Propagation; Microwaves, Mozzarella Burgers and Mountains; The Lure of Two Metres; From Russia with Love; PR Group — NYC Marathon; Dr. Glen: An Uncommon Man; Quiet Progress; 1977 Can-Am Contest Results; Rules, ARRL International EME Competition; April CD Party — All ARRL Members. ■

IARU NEWS

The Federal President, David Wardlaw VK3ADW, and the Immadiate Past President, Michael Owen VK3KI, visited New Zealand over the Queen's Birthday week-end at the invitation of NZART.

They attended meetings of the NZART Council as well as the annual Conference of the Society. The visit was reported as being extremely useful and a free ranging exchange of views occurred, especially in relation to preparations for WARC 79. ■

QSP

DID YOU KNOW?

That NASA has launched the world's most powerful communications satellite? Jointly developed by the USA and Canada, the Communications Technology Satellite boasts 200 watts of power to transmit written messages, television pictures, and voice communications. "Marisat" satellites were positioned over the Atlantic, Pacific and Indian Oceans to facilitate maritime communications.

That Ham signals above 80 metres frequently reach the moon at enough strength to be quite readable? If a receiver up there using a decent antenna was tuned to the frequency, most moderately powered transmitters that use dipoles, which radiate appreciable power straight up, reach the moon when it is high in the sky, providing the ionospheric critical frequency is low enough to permit the signals to punch through at high radiation angles.

"Ham Radio", December 1977. ■

HAMADS

- Eight lines free to all WIA members. $9 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Repeats may be charged at full rates.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTHR means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.

EVENTS

CAPRICORNIA AMATEUR RADIO FESTIVAL, conducted by WIA Central Queensland Branch, will be held in Rockhampton, 16-17 September. Interests for everyone. For details write: Secretary, Box 496, Rockhampton 4700.

FOR SALE

Kenwood TR7400A, 800 ch. 30W FM Txcvr., ex. cond., in original carton, instr. bk., mic. and mobile bracket, incl. serv. manual (worth $20), $350. VK5ZCW, QTHR. Ph. (087) 25 2407.

Tape Recorder, Phillips 5¾ in. reel/reel and mic., as new, $50; Osker Bloc SWR 200 SWR and power meter recalibrated to give accurate power readings to 146 MHz, $50; AWA MR15 6m FM car phone with preamp, as new, must be sold to license holder only, $60, ONO; 430 MHz ATV convertor from Microlink, brand new, $25, incl. post; Pye Mk. IIIA Tcvr., 53.866 AM, $20; Pye Mk. IIIA Tcvr., 52.100 DSB, $20. Steve VK2ZSC. Ph. (02) 674 2104, after 5.30 p.m. EST.

110 Volt Drake 2B Rx with handbook, has SSB, CW, AM and WWV facilities, requires 240/110V transformer and speaker, $140, ONO; Heathkit reflected power and SWR bridge meter, $15. Both in A1 condition. VK2QL, QTHR. Ph. (02) 76 6861.

Uniden 2020 and remote VFO, immaculate, $750; IC 202 with crystals covering 144 to 144.6 plus Oscar, $170; Heath monitor scope, $100; Stolle rotator, control box and cable, $70; 8Y/2m Jay beam, $35. VK3AZM, QTHR. Ph. (052) 52 1884.

Barlow Wadley Rx, good condition, no FM, $150. VK3AXA, QTHR. Ph. (059) 42 7248.

Uniden 2020 Transceiver, complete with mic., instr. book and service manual, all as new, $595. Heathkit SB600 speaker, $10; Mini Products 20/15/10/6 metre vert. antenna, 9 ft. overall, $25; Powerband 2m solid state power amp., 55 watts out., $35. VK3OM, QTHR. Ph. (03) 560 9215.

Kyokuto Tone Encoder/Decoder, SC-12A 12-channel Selcal units, suit any rig, cost $120 ea., sell $75 ea. (2 only). Mark Webster VK2BAK, QTHR. Ph. (02) 48 6241.

Icom IC202E, SSB, 6 months old, mint condition, in original packing with standard accessories, $170. Ian Cousins VK5IK, QTHR. Ph. Eudunda (SA) 252.

Uniden 2020 HF PLL Transceiver, ext. VFO, matching speaker, manuals, $700; Yaesu FL2000B linear amplifier, 1200W SSB, 572B triodes, $400; Yaesu Y0100 monitorscope, $225; Clegg 27B FM 2m transceiver, 145-147 MHz, synthesised, mobile mount, $125; Teleprinters, mod. 15 page printer, mod. 14 typing reperforator, series motors, both overhauled, $50 ea. VK2BOA, QTHR. Ph. (049) 61 1580.

Yaesu FT75B HF Transceiver with 9 xtls, AC and DC power supplies, external VFO, VC 75 external VOX unit and speech processor and mobile mounting bracket, $550; FT200 with all 10m crystals, plus 11m, $375; Ken KP202 2m FM R2, R8, 40, 50 with nicads and charger, $160. Jim Hendrickson. Ph. (03) 726 5060.

Freq. meter, 0-30 MHz, $150; counter, 0-100 MHz, HP 524 DR, $110; sig. gen., 10-300 MHz, $140; R210 Rx, 24V, 2-16 MHz, $60; C-11 Tx, AM/CW, 60W, 2-16 MHz, xtal cal., etc., $30; C-42 Tcvr., 38-60 MHz, $20; Scorpion transverter, 28 MHz, 2m, 100W, $120. Doug Johnson VK3YMG, Shepparton. Ph. (058) 21 2309.

FR-101 Rx, all bands to 2m, excellent condition, $700, ONO. B. G. Roche, 103 Sig. Sqn., Lavarack Bks., Milpo, Townsville, Qld., 4813.

Power Transformer, 230V 50 Hz primary to 115V secondary at 2000W, in good condition, $120; also power transformer, 240V 50Hz primary to 110V secondary at 1000W, in excellent condition, $85. Both transformers in steel boxes with 240V leads and 3-pin plugs and have a number of American 2-pin socket outlets built in. VK4XT, QTHR. Ph. (074) 62 2389.

Coaxial Remote Control Switch for 2 antennas, $10; audio filter for CW F-520, $20; frequency marker, 5-400 kHz and 5-120 kHz, $20 ea.; auto-level solid state compressor, $30; line filter, 100V 5 amp., $5; amperex tubes, 2 6LF6, $5 ea.; amperex tubes, 2 5894B/8737, $30 ea.; Toyomura 2m Rx amplifier RB-145, $22; Vanguard RF pre-amp 28.6 MHz Rx only, $20. VK1BH, QTHR. Ph. (062) 65 5385 Bus., (062) 88 6062 A.H.

Ch. 40 xtals for AWA MR Series, 4055.55 and 10285.71 kHz, never used, made by AWA, $10. VK2BAD, QTHR. Ph. (02) 72 1107.

Communications Rx, realistic DX160, as new cond., perfect order, with instruction manual, $120. Keith Long VK2NII and VK2BYL, 1 Moola Pde., Chatswood. Ph. (02) 428 5354.

Yaesu FT901DM, the ultimate status symbol transceiver, new and complete with mic., AC and DC plugs, etc., English language instruction manual (not photocopy), will demonstrate "on air" this QTH and air deliver any capital city, $1,400. VK3SB, QTHR. Ph. (03) 550 3521.

Teletype Machines, type 15, excellent cond., with h'books, $65 and $75; SSB, AM, CW transceiver, 3-band, 80 and 40m coils fitted with provision for 3rd band, suit novice, 25-30W PEP, with VFO, $165. VK2ZHS, QTHR. Ph. (02) 59 5390.

Solid State Forrest-Phone, suitable for 160 or 80m, $40. McLeod Transceivers, $30 ea. 144 MHz — AC Rx, converted, $50. Car phone w. crystals, 7 ch. VK3NCF. Ph. (055) 62 2162 or (055) 62 7140.

SSTV Monitor, kit includes 11 in. tube, W0LMD circuit completed, EHT supply, 460V CT and 6.3V AC, A and R 6672 transformer and 2 off A and R 2155A transformers, plus 2 off 40 mFd 450V, 2 off 2500 mFd 63V, 1 off 1000 mFd 63V electrolytics, $150, ONO; Quad, 2 element spider commercial unit, hub spreaders, etc., $120. VK4AAT, QTHR. Ph. (07) 208 7898.

Collins KWM2 and power supply, $1600. Kenwood 820, $835. Yaesu FT301, $835. All in perfect condition. VK7AZ. Ph. (002) 44 1165.

TV measuring CRO, Marconi TF1277 C/W markers, delay, single or differential I/P, in-line monitor facility both channels. Sync section requires some work, $275 firm or swap for TF995A/5 generator or similar or Kyokuto FM mobile. Also Marconi TF142E distortion meter, $70, and Telemax frequency meter 85 to 1000 MHz incl. mains PSU and charts, any offers, cash ad,ustment on swaps if needed. Ian Foster VK3BLF. Ph. (051) 56 8311 anytime.

Immaculate FT101 Mk II inc. manual, factory packing, fan mod. only, magnificent condition, $540 ONO. Heathkit SB610 monitor scope kit, complete, only $300 inc. manuals. TR2200G FM carry portable, nicads and AC powered, 7 repeaters and 3 simplex ch. fitted — value $220. IC22A, ch. 2, 4, 6, 8 repeaters and anti repeaters; 3, 5, 7 repeaters and 7 simplex channels (an IC22S at IC22A price) — $240. FT75B including AC and DC PSUs, FV50C ext. VFO, 3 ch. all bands, immaculate condition and performance, $550. FTDX401 & FV401 ext. VFO & "Magnum Six" RF speech processor, combination for the serious Dxer, excellent condition, all manuals, $700 (will not separate). VK3ATR, QTHR. Ph. (03) 336 1054 AH.

Complete station, deceased estate. Collins KWM-2 unmarked with PM2 power supply, instruction book and homemade amplifier to suit, all in proper working order, $1850. Also tilt-over tower, approx. 40 ft. with 3-el. 20m and 2-el. 15m yagi and 2m antennas. HAM-II Rotator control unit and cable antenna to be dismantled, Kew Vic. VK3AHR, QTHR. Ph. (03) 836 4203.

6m Transverter, almost comp., uses 3/12 in final, $20. Two 813s and sockets, $20. Trans. dip meter HB, not cal., $15. Two 80m Novice band xtals, $15. Assorted MC meters — offer. Heavy current/high voltage power supply, suit linear amp., $80. Doug Margetts VK3NGG, 29 Bolinda Rd., Nth. Balwyn, Vic. Ph. (03) 857 8475.

R2553 Communications Rx, 29 1 MHz bands, 1 kHz dial calibration, 1.5 to 30.5 MHz, manuals, phones, excellent condition, $250 ONO. Also available — spare modules, Collins mech. filter, 500 kHz BW 3.1 kHz for above. Allan VK2GR, QTHR. Ph. (02) 47 4344.

Kenwood UHF Transceiver, 700A all-mode unit, 12 months old, in excellent order, $495. Kenwood 7200G mobile, xtals, reptrs. 2 to 8, simplex 40, 49, 50, 51, 52, $195. Swan 500 HF Tcvr., excellent order, only $295. VK3GM, QTHR. Ph. (053) 49 2028.

1 Crystal Lattice Filter, XF-30B, made by Yaesu for AM, give 6 kHz band-width, ideal for FR101 and FT101, with instructions, $35. VK8CO, QTHR.

Collins KWM 2 SSB Tcvr. with Collins AC power supply, Collins speaker, Collins samsonite case to suit above, new Shure 404C mike, as new condition; had very little use, $1,695.00. James VK2JO. Ph. (02) 36 7756.

QR666 Gen. Cov. Rx, exc. cond., with handbook $160, ONO. B. Bathols VK3UV, QTHR. Ph. (03) 90 6424 A.H.

WANTED

DV21 or DV21A in good condition (matching synthesised VFO for Icom IC21A). VK3ARZ, QTHR. Ph. (03) 232 9492.

Webster "Band-Spaner" or similar antenna, suitable for portable work. Also roller inductance (ceramic), approx. 30 turns 2 in. diameter, for aerial tuning unit. VK2ARK, QTHR. Ph. (063) 86 2709.

FT-200 Transceiver with AC power supply. Details to VK3OM, QTHR. Ph. (03) 560 9215.

Transceiver or Transmitter to suit Novice, in working order and reasonable condition, up to $100. Contact Warren Brown. Ph. (03) 570 6729.

Transformer, 240V primary, 350V sec. ±15 volts, at 40 mA or more. VK3ZRO, QTHR. Ph. (03) 92 2634.

SILENT KEYS

It is with deep regret that we record the passing of —

Mr. G. K. PARKER	**L50916**
Mr. J. C. GUTCHER	**VK3APU**
Mr. D. E. BURGESS	**VK3YAX**
Mr. G. N. MARKS	**VK6AI**

FV401, also matching transmitter to FRDX400 for collection of 400 series equipment. Ian Foster VK3BLF. Ph. (051) 56 8311 anytime.

Circuit of ex-Army A510 Radio Set wanted. Also want sockets for 2AP1 CRO tube. VK4NS, QTHR. Ph. (07) 59 1945.

WANTED KNOWN

Reserve the date — Trial Novice exam — Saturday, 16th September, 2 p.m. Club instructors please note: Details WIA (NSW) Education Officer, Box 109, Toongabbie, 2146.

STOLEN EQUIPMENT: FROM CAR

Icom IC-22S, Serial No. 6209943 with Scalar mag. base and ¼ whip. Ribbon cable attached to diode board; other end unterminated. Pioneer KP-4000, Serial No. 06889 car/cassette. Also model aircraft accessories and other items. Any information to VK5ZLL, 2 Ruddock Avenue, Hilton, S.A., 5033. Ph. (08) 43 6496.

TRADE HAMADS

GFS Electronic Imports, for Yaesu, Kenwood, Standard, Emotator Rotators, Multiband Verticals, Quads, Yagis and Mobile Antennas, plus many accessories. All presales checked with a 90 day warranty. Low prices that you should be able to afford. Call Greg Whiter, after seven years' experience handling Ham equipment he knows your requirements. Ph. (03) 873 3939.

S-100 Microprocessor Kits from Stock — We supply by return mail or road transport a wide range of S-100 microprocessor kits and bare boards from stock Kits for 8080A and Z80 CPU, memory, I/O, motherboards, power transformers, card cages, etc. Good prices on chips, programming service for 2708 EPROMs, software development and assembly. Write for details now to The Micro Shop, Box 207, Gawler, SA 5118. Mail orders only.

ADVERTISERS' INDEX

AMATEUR ELECTRONIC IMPORTS	44, 45
AMATEURS PARADISE	25
AUSTRALIAN SOUND AND SIGNAL	15
BAIL ELECTRONICS	38, 39
BRIGHT STAR CRYSTALS	25
CHIRNSIDE ELECTRONICS	20, 21
CUSTOM COMMUNCATIONS	37
DELTA COMMUNICATIONS SERVICES	25
DICK SMITH ELECTRONICS	52, 53, 54
ELMEASCO INSTRUMENTS PTY. LTD.	60
EMONA ELECTRONICS	30, 31
G.F.S. ELECTRONIC IMPORTS	46
GRAHAM STALLARD	14, 26
HAM RADIO SUPPLIERS	2
PIEZO ELECTRIC PRODUCTS	45
SCALAR INDUSTRIES	5
SIDEBAND ELECTRONICS IMPORTS	22
SIDEBAND ELECTRONICS SALES	14, 36
SPECTRUM INTERNATIONAL	26
TRIO-KENWOOD	59
VICOM	13
WILLIAM WILLIS & CO.	45
WERNER ELECTRONICS	37

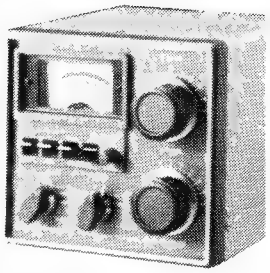
KENWOOD AMATEUR COMMUNICATIONS

WHENEVER YOU WANT TO MOVE UP — KENWOOD HAS THE WAY

TS-820 SERIES

FEATURES

- The AT-200 is an antenna tuner designed for use with the TS-520S and TS-820 series although it is compatible with most of today's HF transceivers.
- The AT-200 consists of an antenna coupler, a through-line RF wattmeter, an SWR meter and an antenna switch.
- The AT-200 is designed to be used on the amateur bands between 1.8MHz and 29.7 MHz.
- The RF wattmeter has two ranges, 20W and 200W.
- The antenna switch has four outputs. Two of these are for coaxial fed antennas, one is for a wire antenna and one is for connecting a dummy load.
- The AT-200 is also capable of matching your transceiver with a wire antenna such as an inverted-L. This makes it possible to enjoy communication on the lower frequency bands.



SPECIFICATIONS

Frequency Range	160 meter band— 1.8 to 2.0 MHz
	80 meter band— 3.5 to 4.0 MHz
	40 meter band— 7.0 to 7.3 MHz
	20 meter band—14.0 to 14.35 MHz
	15 meter band—21.0 to 21.45 MHz
	10 meter band 28.0 to 29.7 MHz
Mode	SSB, CW, RTTY
Drive Power	80 Watts or more for full output
RF Input Power	SSB: 2,000 Watts PEP
	CW, RTTY: 1,000 Watts DC

The new KENWOOD TS-700S is the all-mode solid state transceiver that provides you with versatility plus over the entire 2 meter band. It's feature-packed design puts you on SSB, FM, CW, and AM. The AC and DC power supplies are built in which allows you to operate the TS-700S just about anywhere. Equipped with a VFO that enables continuous tuning from 144—148MHz, the TS-700S comes complete with built-in digital frequency readout, receiver preamplifier, VOX, sidetone, and microphone.

"TRIO-KENWOOD (AUSTRALIA) PTY. LTD."

30 Whiting Street, Artarmon, Sydney N.S.W. Australia 2064. Telephone (02) 439 4322

DRAKE TR-7
continuous coverage

Introducing a remarkable engineering breakthrough...

Models shown are Drake TR-7/DR-7 with RV-7 and MS-7

0-30 MHz
continuous coverage reception capability

160-10
Amateur Band transmission, including capability for MARS, Embassy, Government, and future band expansions*

The Drake TR-7 System significantly advances the technology of worldwide radio communications and unfolds an entirely new state of the art.

Call, phone or write for a detailed brochure NOW

ELMEASCO
Instruments Pty. Ltd.

P.O. Box 30, Concord, N.S.W. 2137.
Telephone: 736-2888.
Melbourne: P.O. Box 107, Mt. Waverley, Vic. 314
Telephone: 233-4044.
Adelaide: 42-6666; Brisbane: 392 2884.
Perth: 25-3144.

THE Bulletin

W.A. SUPPLEMENT TO " AMATEUR RADIO " AUGUST 1978.

oooooooooooooooooooooOOOOOOOOOooooooooooooooooooo

Patron: His Excellency the Governor,
Air Chief Marshall,
Sir Wallace Kyle. G.C.B., C.B.E.,D.S.O.,D.F.C.,K.of St.John.

President: Mr.L.A. Ball VK6AN.

Secretary: Mr. P. Savage VK6NCP.

Treasurer: Mr.A.van den Avoort VK6CU.

* * * * * * *

CORRESPONDENCE.

Please address all correspondenc to:-
The Hon. Secretary,
W.I.A. (W.A. DIVISION).
Box N1002.
G.P.O. Perth.
W.A. 6001.

* * * * * * * * * * * * * *

As this screed is being typed, the news of local amateurs is not good. Reports to hand would indicate that Hugh VK6FS was stricken with appendicitis but should soon be back operating on his favourite 20 metre band.

Len VK6WN has also been hospitalised and we wish him a speedy re covery.

Ron VK6KW, recently suffered a heart attack and it is hoped that by the time this reaches you he will be well on the road to : health.

All the best to the three of you and to any one else who my spies may have missed.

The grapevine has also yielded the information that VK6JG, Ted has returned to the sunny ? west. Welcome back O.M.

A spot of news from a passing sea-gull, to the effect that VK6CIG, Irwin Gerbers, is sheltering in his vessel at the Two Rocks Marina -- Welcome to the West and safe sailing.

* * * * * * * * * * * * * *

How often would this happen ?

Les VK6EB and XYL Poppy VK6NEB working DX on 15 metres, were fortunate enough to make contact with another husband and wife team, JK1DWP and his XYL JK1DWQ.

* * * * * * * * * * * * * *

THE SECOND WEST AUSTRALIAN ANNUAL VHF/UHF TRANSMITTING CONTEST.

RULES.

1. DURATION:- SATURDAY September 30th, 1978 and Sunday 1st Oct,1978 on both days between the hours of 1930 and 2200 W.A. Time. Five operating hours in all.

2. FREQUENCIES:- All contacts to be made on the 52/144/432/1296 MHz bands using any of the following modes:-
CW, S.S.B.,AM, FM, RTTY,TV.

3. CALLING:- Stations will call CQ WAA using the three times rule technique.Infringement of this rule by the usa of long CQ calls may entail disqualification,as will the pre-arranging of QSO's. Cross band or made QSO's or mobile contacts not permitted.

4. POINTS:- Points for contacts are as follows with the exception that stations using the following modes will get the additional multiplier shown.

(a)	C.W.	will get a multiplier of	- 3 (
(b)	SSB	" " " "	- 2 (
(c)	AM	" " " "	-4 (
(d)	FM	" " " "	- 1.5
(e)	RTTY	" " " "	-3 (
(f)	TV	" " " "	- 3 (

Mode Multiplier

5. POINTS PER CONTACT:- 52/144/432 MHz :- For the transmitting stations up to 250 ft above sea level and to a 20 Km radius. -5
For stations 250ft to 1000ft A.S.L. and to a 40 Km radius -3

For each kilometre over the radius - - - 1
Also applies for repeater use.
1296 MHz For each kilometre from Tx - - 5

Above scoring applies to all W.A. Shires.
An additional multiplier shall be applied for the inner and outer country shire areas as follows:-

Metro	to Metro	shires a Multiplier of			- 1
"	" Inner	Country Shires a Multiplier of			- 2
"	" Outer	"	"	"	- 8
Inner	to Inner	"	"	"	- 3
"	" Metro		"	"	- 4
Inner	to Outer		"	"	- 10
Outer	to Outer		"	"	- 6
Outer	to Metro		"	"	-10
Outer	to Inner	"	"	"	-10

Additional Multiplier

6. SCORING:- Stations may be worked twice on each night i.e. once between 1930 and 2115 and again from 2115 to 2200 and these contacts will count for points. Each time contacts will take the form of an exchange of RST followed by Shire letters and last two numbers of your postcode e.g. station in Bassendean would send 599BA54 or if in Armadale 599AK12.

7. LOGS:- Contest logs to be neatly set out on one side of quarto or foolscap sheet ruled as shown below:-

Date= Your Shire = Scoring =POINTS x Total Multipliers+ kilom.= Total Pts.
Your Code =

TIME	FREQ	MODE	CALL WKD	RST OUT	RST IN	SHIRE	CODE	POINTS	DIST	MODE MLT	ADD MLT	TL PTS
19.30	144	FM	VK6XYZ	59	59	CA	55	5		1.5		7.5
19.40	144	RTTY	VK6ZYK	56	56	BO	44	5	200	3	2	225
19.50	144	R.FM	VK6YZX	59	59	BY	30	5		1.5	1.5	15
												2475

Rules contd:-
Last column to be totalled at the foot of each page and the running totals brought forward.
The last page should contain the following summary:-
Total number of contacts and total number of points scored - input power and comments on equipment and aerials used - and approximate height above sea level, with comments on the contest in general.

Logs to be addressed to the WAA CONTEST COMMITTEE, PO Box 6250,Hay Street East,PERTH. W.A. 6000 and posted so as to reach us not later than 20th.OCT. The results will be published in the December issue of the W.A. Bulletin.

* * * * * * * * * * * * * * * * * *

CW - IMPENDING DEMISE ?

From Region 7 News by Tom CLARKSON ZL2AZ.

Every now and again we see some reference to a decrease in morse and CW in amateur activity and an inference is drawn that the use of CW will fade out,and perhaps the sooner the better,to make more room for telephony.Some critics of CW feel they have dealt it a telling blow by putting it in a cate gory together with "smoke signals". I would like to put forward the view that CW is part of the amateur scene that should be encouraged. We all have the u urge to seek self expression via amateur radio,and the exact form this express ion takes varies tremendously - there are a dozen or more widely differing fields of endeavour,quite highly specialised,that do not overlap among thom-selves but are nevertheless properly grouped within this voluntary "service of radio communication" and go to form its corporate strength.It ill behoves any of us to deprecate on activity cherished by sections of our fraternity. I believe it is an error to try and evaluate CW in terms of telephony or vice versa,and that unless this error is recognised and avoided serious misunders standings may develop.

If CW is destined to fade out I would like to pose the question,why has it not done so before now?Radio Telegraphy is only about ten years older than radio telephony-so why has it remained alive- to the extent that today the CW bands in popular parts of the spectrum are full to overflowing?While there is no doubt that the traditional telegraph has been largely displaced in the exchange of the world's information, the demands there have been different from those met and experienced in the amateur service. Here the durability of CW may well be due in part to hidden or unrecognised characteristics. The solid virtues of morse and CW as a means of transporting the written word through a variable medium are well known and have contributed to the ability for them to prevail.But might there be some other influence at work, not so evident but powerful enough to keep the merry cadence of CW going strongly perhaps indefinitely.

The derisive term of "smoke signals" could even have an element of glorification in it.As a boy in Napier I was amused by seeing there a notice on a sign painter's shop" I made signs before I could talk". Years later I I came to recognise a powerful element in this simple observation,by apprec iating the presence of significant influences when any mode of communication is involved. But such influences are only evaluated when the means of commun-ication are studied fundamentally - when the means is considered as acting as an extension of the mind,the same way as the roof may be considered to be an extension of the scalp or the wheel may be considered as an extension of the foot.The status of amateur CW is likely to be enhanced by a scrutiny of the fundamentals it is involved with.

It is easy to trace the decline of the telegraph from its palmy days of eminence in the official and commercial world and when the telegram was a common thing in the home. Telegraphy was associated with a phase in civiliz-

ation which accompanied the dominance of writing,printing,the book,the news paper,the trial balance,the telegram,and which is now being superceded by the visual and aural electronic services of the telephone,broadcasting,the computer,and TV,which are in the process of moulding our age.

But where is the counterpart in the use of CW in our amateur activities? Here there is a different situation. Most CW contacts consist of the exchange of thoughts. Expressions such as "how is copy" may be used but are not actually written.Even notes "on the cuff" will be very meagre. This p process is enhanced in effect by the art of the skilled amateur operator in his subconscious use of abbreviations and the jargon that has developed (though this jargon is never actually uttered or written). The code itself has evolved into a remarkably efficient one,despite its age,even when compared with other recent codes. It is of course rather different from the Samuel Morse original.

There is another unique factor involved in the use of morse in the amateur service.While public telegraphy had highly developed high speed and printing systems,using morse these were for sending and receiving written messages;but for exchanging thoughts between individuals there was nothing then available approaching the advanced types of keying devices now commonly used by amateurs. The amateur using CW today is not so much a telegraphist as an exchanger of thoughts by means of signals.So we are dealing with a system very closely knit with mental processes. The "personal interest" aspect of the defined amateur service seems to apply to it a very direct manner. Even if the importance of the printed word declines or becomes unimportant in many world affairs,as has been predicted,there should still be a place for a system that enables meaningful signals between minds of individuals to be exchanged instantly,without recourse to speach or language,even at great distances,and with no intermediate facilities or control. Whether recognised or not I suggest that it is in this area that amateur CW has a secret weapon that will ensure its survival and prosperity.

So in our amateur service,which embraces so many different activities CW morse should be recognised as a worthy participant and all plans should provide for its welfare and growth. Established amateurs who concentrate on telephony and other modes should respect the claims for CW, and newcomers to our ranks should be encouraged to become really skilled in it- to discover its special character - to find out why so many are drawn to work on the CW bands.

* * * * * * * * * * * * * * * *

Some food for thought there isn't there ? Any comments ? ?

* * * * * * * * * * * * * * * *

Recently to hand is the following list of awards offered by the Far East Auxiliary Radio League (FEARL).

Worked 15 KA Stations. A station must have established contact with 15 KA stations,regardless of length of QSO.

KA Ragchewers Award. A station must have conducted a continuous QSO with any KA station for a minimum of 30 minutes.

KA Ragchewers Supreme Award. Astation must have conducted a continuous QSO with any KA station for a minimum of 60 minutes.

KA Roundtable Award. A station must have conducted a continuous QSO with 2 or more KA stations for a minimum of 30 minutes.The QSO's must be at the same time and on the same frequency.

Note;A good place to meet KA stations is the KA net,which meets every Sunday at 0200 Z on 14.285 MHz .

Our congratulations to Neil VK6FI who recently received the KA ragchewer's Award. FEARL Awards Manager, c/- Sam Fleming,ASAGARH-ID-GS-M, APO San Fransisco, California. 96343.